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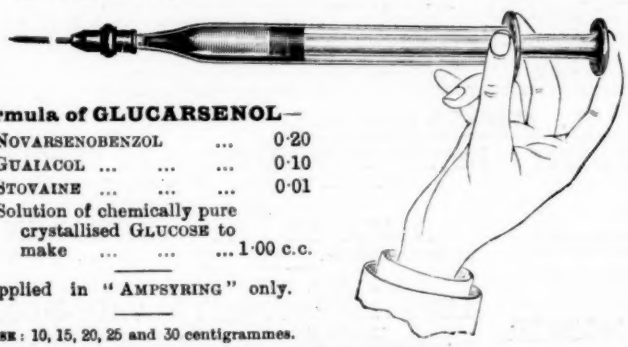

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BY THE RT. HON. SIR CLIFFORD ALLBUTT, P.C., M.D., F.R.S.,
REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE.

IN the issue of THE LANCET for July 2nd of this year (p. 33) Dr. C. M. Wilson, of St. Mary's Hospital, published certain reflections of weight and importance on this subject. I have been invited to make some comments on Dr. Wilson's article, and to express a further opinion upon this new system—new in England—of medical teaching and research. Dr. Wilson's article is so far-sighted and even-handed, so well balanced between the ideal and the practical, that if I may venture to comment upon it, and to underline it, I can add nothing. How then for the best is the new system to be constructed, and to be used for these ends? We all agree that, in advanced work, teaching, if it is to be effectual, must be inspired by research; and, to most researches at any rate, teaching, if not too elementary or too laborious, is one of the incitements.

Some years ago, in the pre-war period, Sir William Osler wrote to ask me to take part in an endeavour to attract to English schools some of those overseas students who then were betaking themselves to Paris, Berlin, or Vienna; but hardly deigned to visit our medical schools, even on their way. With these aspirations I agreed, warmly agreed; but argued that these visitors would come here when there was something definite to come for, and not till then. In those continental capitals, as also in the New World, Medicine was taken seriously both as science and art; as seriously, let us say, as astronomy, engineering, chemistry, agriculture, and so forth. In these and other vocations, to teaching and research highly qualified men were giving their lives. In like manner, in the foreign cities, scientific medicine was in the hands, and under the influence, of a professoriate. Yet the visitor to a great London hospital school would then have found some admirable elementary teaching for junior classes it is true; but that for the eminent men of the staffs, men whose names were household words, the hospital visit was but a part, indeed a secondary part, of their calling. As things were, the main time and available energy of these masters of their craft were spent, and necessarily spent, not in the medical school but in Harley-street. Their hospital teaching was but a scattering of crumbs from their tables. In a short hour or two the visitor would pick up some impressive and sagacious remarks; aphorisms worthy of Hippocrates; thoughts distilled out of a large empirical experience and great personal qualities; but to leisurely and systematic clinical research, to patient devotion in clinical investigation, there was hardly a pretence. Nor was any one member of a hospital staff made personally responsible for the coördination of the clinical studies. Osler's brief reply was characteristic of him: "I am showing your letter to X., Y., and Z.; it will do them good." I need not occupy space in saying how, under one influence and another, a revolution is now coming about in certain large hospitals; a professoriate has been founded in their schools, and systematic progress is being made.

PRACTICAL *v.* THEORETICAL.

There is an old and perhaps perennial schism between the "practical man" and the "man of theory"; indeed, the word "theory" has become almost a term of abuse. Each has some right on his side, and the "practical man" is well aware of the right on his own. But in our time the development of the physical sciences has become an essential condition of congregation in large cities, as essential as was magic in the welding of primitive folk; and as under this urgency the strides they have made have been enormous, the contrast has become more and more vivid; the theoretical man is regarded as a child in affairs, the practical man as a "muddler through." Thus in our profession the practical, that is the clinical, man declares that he has little use for the laboratory, while the scientific physician is apt to regard the clinician as a mere empiric. Yet, if there are truths and values on both sides, we must try so to blend these opposites that each may enlighten and reinforce the other.

For it is true that if the two methods are not radically different they are somewhat divergent. The scientist, seeking for a "shorthand" expression of a series, must proceed by selecting those features of things which they have in common, and by neglecting those which are individual. He empties out the peculiar features which to the clinical man are precious. To the scientist values are irrelevant, the clinical man thinks that it is only in *being* that one thing is better than another; the scientist delights in the width of his comprehension of things, the clinical man tries to penetrate into the innermost recesses of the personality, and finds it to be no less inexhaustible. Moreover the practical man complains that the scientist encourages the student to evade the discipline of particular diagnosis by instrumental short cuts. Happily however the majority of physicians are neither mere scientists nor mere clinicians, but partake of the qualities of both characters. The ideal therefore that we have to aim at is so to educate the student—graduate or undergraduate—that he shall not be a scientist detached from individual instances, but, whatsoever his calling, a practitioner; a practitioner however whose clinical observation and invaluable traditional rules of thumb shall be enlarged and corrected by the breadth, the methods and the accuracy of analytic science. How is this end to be attained? To answer this question Sir George Newman and the Clinical Units are addressing themselves, and Dr. Wilson is examining their position and prospects.

COMPOSITION OF A CLINICAL UNIT.

In any field of science and practice a small school must depend on the chances of individual leaders; but for the growth and advance of a large school the "spearhead" must be forged of more permanent and more various materials. The leader must not be superseded; he must become the foreman of a team. Such a combination is called the "Unit"; and the members of it are in union to fortify, inspirit, and supplement each other in the search for and discovery of knowledge. This function, if less directly engaged in the teaching of students, yet makes for the life and increase of the whole school. In Medicine there has been, indeed, a great waste of workers. Young graduates of ability, attracted by the life and movement of the school, and unwilling to pass away at once into the somewhat superficial routine of practice, too often, during the most precious years of their lives, have been left to hover about the field while they ought to have been in the thick of the battle. These men are now to be welded into the spearhead, and will do brave work; helping on the cause, and training and storing their own minds before settling down to more material engagements.

But who are to be the leaders? I am tempted to go so far as to say that, if possible, a school should not construct, or renew, its unit until it sees, within or without its own walls, the man it needs. It must have the foresight to discover its new leader among the young men, say under 40 years of age; the leader should not be a mere clinician, nor merely a laboratory worker, but one who has a "footing in both camps," and knows the scope and power of each. He should produce evidence of work, not merely diligent and incidental, but systematic, consistent, coherent, and imaginative; work showing both grasp of detail and breadth of view; and above all he must have in him the fire to kindle other men. These qualities should

in this case be preferred to a gift of facile teaching; if both cannot be had. The Unit may not teach much directly to the undergraduate, but it will form his teachers and "create an atmosphere." Those of us who had not such advantages—at any rate not at home—found out to our shame that on the old individual system it took us a quarter of a century to learn how to teach the beginner. And, as Dr. Wilson admirably says, in the Unit there is something more than the craft teaching—"nothing is so important (to the students) as the mute example of the lives of their teachers, ... that they should have in their midst a body of men whose lives are given to something other than the lucrative rewards of private practice."

And as for the Director, so for his associates; the settled work of the unit brings many blessings with it—not least a relief for a while from care and fuss, from hustling advertising methods, and anxious pressure towards premature publication. The organised worker has time to read and, what is better, to think, to assimilate new knowledge in meditation and converse, to sweeten his mind in familiarity also with art and letters; on the other hand, he has not to grudge the time for the prosecution of the more tedious and elaborate methods which make for thoroughness. If we fail to secure Directors having these ideals and qualities, the great expense of their institution will, as Dr. Wilson says, be wasted. Such a waste is to be deprecated at any time, at this time it is perilous to the whole movement. No risks must be run while parsimony is to begin, not in the fortresses of material ascendency, but upon the finer issues of the human spirit—in education, in health, in the finer arts, about which the public is supposed to be less vigilant.

ELECTION OF DIRECTORS.

The difficulty of securing Directors such as we desire suggests a few remarks on the mode of their election. It is easy now, when good appointments have been made in the London University, to say, nevertheless, that the mode leaves something to be desired. At present the election is virtually in the hands of the honorary staff of the hospital concerned. It is true that hitherto the hospital staffs have used their power loyally and with moderation; but this gives us no guarantee for the future. In the London University it would be better for the Senate to establish standing election committees, renewed by rotation, of independent—that is, ad hoc unofficial—persons of distinction in the several parts of Medicine. The hospital staff would thus be relieved of the duty not only to consider the claims of particular interests or promotions, but also those of past services or private friendships.

On the distribution of the teaching of the hospital I venture to formulate some definite principles. We are not to suppose that, in medicine, surgery, or gynæcology, to establish the Unit is to disestablish, or even to diminish, the teaching of the rest of the honorary staff. In my view of this matter the teaching of the undergraduate would remain almost wholly with the honorary and resident staff, as in the past; though the several parts and methods of it should be distributed and organised in some close dependance upon the Unit. Advanced instruction in the specialist departments would be in intimate association with the Unit. Do we not foresee two kinds or varieties of teaching, each to be distributed to its own quarters? The undergraduate knows that his time is short, and examinations near ahead; he wants his instruction to be precise, terse, and dogmatic; he is not ready for twilight apprehensions, nor for tentative and balanced judgments, nor for adventures on the outskirts of the known. He is apt to call them "rot." What he wants he will get better from the less speculative and more empirical side of the house. As I have said, our English teaching is for the prentice stage excellent, perhaps incomparable: do not let us disturb it. The director of the more advanced work, the team-work, will gather about him rather the pioneer squadron, the graduates who need "refresher" courses, men who have gained time and self-control enough to let loose a little imagination; he will attract the foreign visitors, and draw to his side—let us hope—some of his own honorary colleagues. Bence-Jones's frequent introduction of eminent foreign professors is among my happiest and most fruitful recollections of St. George's. Such an audience, such disciples, will be numerous enough to make the Directors' classes as large as they ought to be. And besides these there will always be borderers, half-ripe students moving between the junior and senior sides, who will blend the teaching into a whole, and diffuse the "creative atmosphere," the breath of the spirit on the face of the waters. If I may allude to my own experience, the Directors will do wisely to make place incidentally for their brother directors of pathological and biochemical laboratories to address the classes on special or more knotty points of their several subjects. Thus the senior student is led to recall his half-forgotten drills and discarded text-books on physics and chemistry, to realise the unity of all these sciences, to discover in their search the omnipresence and omnipotence of surface actions, of ions, of catalysis, of colloid and other molecular chemistry, and so forth. Thus they learn also that to look forward they must continually look backward and beneath. Nevertheless each unit should be provided with its own small laboratory for current work; the larger or more continuous work being consigned to the central laboratories. Indeed, the unit laboratory will be rather differently schemed and more specifically furnished. It can hardly be said as yet to exist in English hospitals, and abroad it is often too far from the wards. One general feature of the unit teaching however there must be which I would not overlook—one of wider appeal. The Director in each clinical department should be expected to give a clinical lecture—say once a week—in the chief theatre, generally with a patient before him; lectures which should be open free to all and any hearers, lay or medical (many biologists, &c., are not doctors), who may choose to attend. Such lectures should be milestones on the pathways of hospital research, and, as they would need careful and leisurely preparation, one public lecture a week in term from each director is all that should be required. I would urge also that, if possible, *a pupil of any one Unit should be made free of all Units*, London and provincial.

THE OUT-PATIENT DEPARTMENT.

Now let me touch upon—I need do no more, as Dr. Wilson has made mention of it—a cardinal feature in the new system—namely, a radical reform of the Out-Patient Department. The changes needed, and the main lines of them, are, I think, so well recognised that I need not stay to dwell on them. But in view of these changes let us not, as Dr. Wilson warns us, overload the Directors with beds. The Director ought not to be burdened with routine, and the out-patient work, with its "beginnings of disease," will occupy much of his attention. One might suggest 40 beds, male and female, as sufficient if, by the courtesy of his colleagues, he is offered some selection from the other beds in the house. By their aid he would be enabled to group cases along special lines of research. The intention is, I hope and believe, especially in the out-patient rooms, to invite outside practitioners to make use of the hospital for consultations in necessitous cases; and further perhaps, under some system of payments, for opportunities of hospital resources, such as X ray work, cardiography, blood culture and morphology, metabolic rates, biochemistry, and so on for patients in less narrow circumstances. In these days of insurance, when almost everyone has his doctor, an office notice should be sent of every in-patient reception to the family practitioner, with a statement of the hours of attendance of the consulting staff and an invitation to attend if he wishes to do so. The wish would grow. We do not realise the waste and mischief of dismissing a patient after (say) eight weeks or more of elaborate investigation and treatment, often indeed

of grave or crucial operation, and then leaving the home doctor in the dark to pick up the broken threads as he can. Moreover, with his aid the "following up" of patients will be made easier and more perpetual.

On the medical side I am strongly of opinion that insanities, at any rate in their manageable phases, should be included with other maladies in the ward and out-patient services, even if only for example's sake. The methods of convenience which exclude and segregate these diseases probably have a bad effect on the sufferers themselves, but they are infinitely more noxious in implanting and nursing the notion that "mental" disease is not bodily disease but something over, under, or beside it. What would be the misfortune to pathology if, let us say, diseases of the kidney were swept out of sight of general medicine? All bodily functions are interdependent; yet again, in tuberculosis, syphilis, and some other infections, such divorces are at least foreshadowed, and should be distrusted.

GRADUATE TEACHING.

On the arrangements for graduate teaching I must make some brief remarks. Of the efforts made to this end by the Royal Society of Medicine and by individuals we cannot speak too gratefully. But, as in my correspondence with Sir William Osler, I drew back a little until the unit system should be settled and in action; for it seemed to me that the two movements must hang closely together. Before the Earl of Athlone's committee I demurred to, and indeed deprecated, the costly proposal of setting apart a peculiar hospital for this part of advanced instruction. Graduate teaching, if not confined to the units, must surely be sown, rooted, and watered in them. A central office and club for these graduates is desirable, but to separate their hospital study would cut the graduate off from the main streams of medical ideals, organisations, and activities; would deprive the units of their senior disciples, and compel the aspiring graduate, whose time is limited, either to desert the peculiar hospital or to surrender the privilege of attending the courses, and of coming under the influence, of one or more of the half a dozen most eminent leaders of the day in medicine and surgery, men of whose friendly encouragement he would have retained a happy memory for the rest of his days. As to the graduates who need only a "brush up," surely there are already in the great hospitals many competent teachers, and hundreds of beds, awaiting their arrival. We are agreed that the choice of leaders is strait; these men are few, and these few are needed for the units; and as the senior men on the honorary staffs are not likely to desert their posts, so the staff of a hospital peculiar to graduates would fall into the second rank. But, after all, of the irony of the world we have many instances, and is there one more mordant than this—that whatsoever we may do to develop and furnish the mind and enlarge the experience of the general practitioner, and to display to him what *can* be done, we send him away (unless he happens to practise near a university town) whither he will find none of these modern means for the application of his new knowledge. Is it not kinder to keep his eyes closed, and his mind in ignorance, that his soul may be at peace?

PROPORTION IN MEDICAL EDUCATION.

And these problems of education lead us on to other difficulties, which the units will have to work out. In his interesting and plain-spoken Hunterian Oration of 1921[1] Sir Charters Symonds declares that in our zeal we are piling up the weight and number of subjects of medical instruction beyond all toleration. To lighten the burden Sir Charters Symonds proposes a utilitarian reform or rather retrogression; he advocates what, rightly or wrongly, is virtually a return to apprenticeship. The student is to be brought to the bedside at the outset, in order that he may have before him continually the aptitudes for which he is to work. Anatomy is to be pruned, and a good third of it cut out, by rejections of its academic features (p. 12). Physiology is to be domesticated in like manner, but not so drastically. The peculiar discipline of anatomy as a standard of close observation and accuracy might thus be lost, for this discipline is all or nothing. Sir Charters Symonds (p. 15) "by no means wishes to be understood as decrying the study of the collateral sciences—these handmaids of medicine"—(but) "do they hold, as taught to-day, their due proportion to the later subjects? However well informed a man may be in the preliminary sciences, the final court of appeal is at the bedside." He must attend rather to the cry of the children than to physical apparatus. And (p. 16) "*The only opportunity the student has for independent observation, it seems to me, is in the clinical field, and the sooner he is brought there the better.*" (Italics in original.) This assertion seems a little hard on the present training in the "collateral" sciences. With one sentence at least we shall all hopefully agree—namely, that "one day we may see the physiologist at the bedside" (p.17). The pathologist should be a frequent, or indeed a regular, assessor.

Does not this discourse on the whole reflect the mind of the craftsman, and rightly so, but at the same time diminish the scientific and thinking physician and surgeon? More than once I have discussed this sort of scheme with engineers, both professorial and practical, and find, with them as with ourselves, that promising as a plan of early shop work may appear, the apparently irremediable consequence, in the ordinary student, is that at a later stage his attention to the science of his profession cannot be recovered; he settles down on rule of thumb, and is quite contented without its principles. The housemaid knows well enough how hot water may crack a glass vessel, but cares not why. But ere long the scope of the units will have to be reconsidered. I venture to repeat my oft-told opinion that the divorce of medicine and surgery, due to medieval disdain of handicrafts, cannot last. In this generation already it has landed us in an absurd position. Such specialism as must be will be on a plan, perhaps a topical plan, of redistribution, and the physician (to use the word in its general sense) must learn to deal, as does the gynæcologist, with all sides of his case. And are not these phrases "collateral" sciences, "handmaids of medicine," and the like, misleading? These sciences are not annexes of medicine, nor frills about it, but partake of its very nature; they are mothers, not hirelings. As Sir David Prain said the other day to the Pharmaceutical Society: "Originally, practical pupilage worked fairly well. The surgical *fabrica* . . . . was patent to the eye, and (aseptic principles being unknown) success in practice depended on caution, manipulative skill, ... natural capacity, and saving common-sense. But students discovered that they could not grasp (the underlying truths) . . . . without some kind of physics, and some understanding of the structure and function of vital mechanisms."

But it is true notwithstanding that the tides of teaching are overflowing the banks! What are we to do? We may indeed take parts of the past into the future, but we cannot walk backwards. At present we are asking what the Units will tell us. Sir Charters Symonds says that under the unit system the first year's men are being called into the out-patient department: a call that should come from all the recognised teachers. He says also that no one desires to lengthen the curriculum. This may not be our desire but it is what we are inevitably doing. At Cambridge we are putting back the physics and chemistry to the schools, and with some success; yet, even with this anticipation, university students are in their sixth-seventh year when they come up for graduation. It may be that professional preparation will divide into two courses—into a five-years course on craft lines for the diploma of the colleges, and a university course for those who have the turn and the time for wider

[1] THE LANCET, Feb. 19th, 1921.

and deeper study; a difference which is perhaps coming about, more or less undesignedly. In any case the universities must not trifle with their standards. At the Congress of Universities at Oxford, on July 8th, 1921, Prof. Joly dwelt on the educational value of even elementary research. He said: "I believe the outlook of a student who has carried out one single research of an elementary kind is different from that of one whose outlook is derived solely from the text-book and the examination. He learns first hand the mental point of view of the investigator. He gets ideas of scientific truth, and of the legion of errors which lie in wait around it, as may in no other way be acquired. He sees the plausible prima facie conclusion break down under the control experiment, or in the light of the inexorable requirements of other participating laws of nature." This lesson we learn in Cambridge from our M.B. and M.D. theses; the student who has done no more than work up an M.B. thesis has awakened in himself a new faculty; he is a new man.

Whole-Time and Part-Time.

One point of Dr. Wilson's article only remains: Is the director of a Unit to be a "whole-time man" or a "part-time man"? It may seem that with the growth of a reputation outside the hospital the temptation to strain a permission to accept outside calls would become irresistible. Again, it is said that the public have some claim on a physician or surgeon of exceptional skill; and furthermore that some outside experience gives the professor a wider view of life, and makes for gentleness and humanity. These last qualities surely have a rich soil for growth in the hospital itself. From my knowledge of foreign clinics, where the professoriate is generally on unit lines, I believe that usually some outside consultations are permitted; yet I am assured, on good authority in many cities, that no misunderstandings arise. The outside fees are pitched high, the professor has work enough to make him indisposed to add largely to it, and he gains moreover an affection for his clinic and a love for research which tend to keep him at home.

Finally however we shall abide by Dr. Wilson's counsel to go slowly, learning our way as we go; that we may develop a system, not in facile imitation of other countries and conditions, but in harmony with the needs and temperament of our own people.

PS.—The important memorandum presented to the University Grants Committee by Sir Wilmot Herringham and Sir Walter Fletcher on their return from the United States in May, 1921, came into my hands after this article had gone to press. All I can now do is to desire for it universal attention; and not in our profession only. It is an encouragement to find that the opinions and counsels of the authors are in close accord with my own.

THE FIRST

Mitchell Lecture

ON

TUBERCULOSIS:

ITS RELATIONS TO GENERAL BODILY CONDITIONS AND TO OTHER DISEASES.

Delivered on Nov. 1st, 1921, before the Royal College of Physicians, London,

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Present Position of Tuberculosis Problem.

My lecture consists mainly in explanatory remarks on some of the main points of the modern tuberculosis problem, illustrated by the relations of the disease to other diseases and general conditions of the body.

The results of clinical observation and experimental research seem to show that tuberculosis, which Sir Robert Philip terms "a vicious by-product of an incomplete and ill-formed civilisation," is—if all "carriers" of tubercle bacilli and all cases of latent tuberculosis be included—so widely spread in the civilised communities of the world that it would be far more reasonable to try to segregate those individuals who have escaped infection than those who have been infected.[1] On the other hand, amongst civilised communities the mortality from tuberculosis seems to be gradually diminishing, apparently as a result of: (1) Relative immunity to "massive" infection, due to infection during early life with minor forms of the disease; (2) diminished frequency of "massive" infection—a result of the modern application of hygienic preventive measures; (3) increase of the general standard of health—less poverty, less overcrowding, less overwork, better food, and better air.

In civilised communities infection (according to the results of von Pirquet's cuti-reaction and similar tests) chiefly takes place during childhood, the occurrence of congenital tuberculosis being so rare (see further on) that it is practically negligible. Apparently the initial infection generally escapes attention, and the disease is at once more or less effectually resisted by the natural vital processes of reaction in the body so that it remains permanently latent, the tubercle bacilli becoming quiescent or gradually dying out altogether. Obviously, all state or national anti-tuberculosis schemes should include special attention to the welfare of children (especially the children of the poorer classes): (1) by furthering their general health; (2) by diminishing the chances of "massive" and frequently recurring infection—for example, by removing them (as is done by the French "Œuvre Grancher") from parents and others suffering from "open" tuberculosis; and (3) by methodically looking out for the first signs of infection and by employing the best means to oppose the disease directly that the first signs of infection are discovered. The tendency to suffer from severe or fatal tuberculosis probably varies somewhat according to inheritance (families and races)—that is to say, owing to a process of Darwinian survival of the fittest amongst communities which have been long exposed to tuberculous infection (Karl Pearson, &c.). Doubtless, the chief reason why the disease especially often tends to assume a grave, rapidly progressive and fatal form in members of primitive communities is that they have hitherto escaped infection (owing to want of exposure) and in their resulting unprotected condition have, on their coming to live in towns or coming in contact with cases of open tuberculosis, been exposed to "massive" infection, just as unprotected children are exposed to "massive" and recurring infection by close contact with tuberculous parents, nurses, &c. (suffering from active and "open" tuberculosis).

Routes of Entry of the Tubercle Bacillus.

The most important routes by which tubercle bacilli gain admission to the body are by inhalation through the air-passages and by the alimentary canal. I may mention here that the placental route (congenital tuberculosis) is so rare that in 1916 I was able to collect practically all the known examples (published in various countries) into a short article on the subject.[2] It is doubtful whether infection ever takes place from man to woman by the genital route. The bacilli very seldom enter the body by way of, or through, the skin, but infection by this route has probably occasionally occurred, for instance, in connexion with the operation of circumcision, by chance wounds, or by direct cutaneous inoculation in various ways. In patients with lupus vulgaris or "scrofuloderma-tous" lesions, who likewise suffer from tuberculosis of the lungs or other internal parts, the infection with tubercle bacilli has almost certainly been much more often carried from the internal parts to the skin than from the skin to the internal parts.

I may here give my personal experience of a cutaneous infection, though it was hardly likely to have been my first infection with tubercle bacilli. One early morning, about October, 1890, when house physician at the Brompton Hospital, I happened to get a slight punctured wound into the deeper cutis vera of the terminal segment of the right forefinger. This bled rather freely at the time, but I had forgotten its existence by the afternoon, when I handled a lung at the post-mortem examination on a virulent case of pulmonary tuberculosis. The slight wound on my finger nevertheless healed up, but afterwards there was troublesome itching and swelling, and, later on, intermittent painful swelling with more or less local redness; there was no actual formation of pus. The little swelling was kindly excised by Prof. von Eiselsberg in Vienna about January, 1891. He wrote to me that microscopical sections showed that it contained giant cells, but that no actual tubercle bacilli were found. The small operation wound healed up, but afterwards broke down again and discharged for some time, and then slowly healed up. During the winter 1907–1908, when examining patients at the Mount Vernon Hospital for Chest Diseases by the Wolff-Eisner-Calmette ophthalmo-reaction for tuberculosis,[4] I discovered that my own ophthalmo-reaction was more strongly positive than that of most or all of my patients who were tested in that way. In July, 1916, my Pirquet's cuti-reaction was an excessively strong one. Although, as I have said, the infection in 1890 is hardly likely to have been my initial infection with tubercle bacilli, an inoculation of that kind is, I think, interesting. It occurred just at the time when my general health and bodily vigour were at their maximum, and certainly my diet at the time was as antituberculous in quantity and quality as any diet could be (so indeed was that of all the house physicians at the Brompton Hospital at the time). It seems to me that in other cases chance infection with tubercle bacilli can seldom have occurred under circumstances more ideally favourable for the production of some degree of relative immunity.

According to Calmette, infection through the conjunctiva is possible in human beings—as by a crying baby's eyes being wiped with a handkerchief soiled with tuberculous sputum—and instillation experiments have proved that this port of entry may occur in animals. Calmette thinks that the usual initial site of entry of the bacilli in tuberculous subjects of all ages is the alimentary canal (including the mouth, tonsils, and pharynx) and holds that the bacilli may pass through a healthy mucous membrane without leaving any trace of their passage or noticeable disease in the nearest lymphatic glands—a process of infection not conforming to the so-called "Cohnheim's law." On these points, however, Calmette's views have not met with universal assent. The bovine type of tubercle bacillus, though relatively rare in ordinary chronic pulmonary tuberculosis of adult human beings, is now acknowledged to be by far the most common cause of tuberculosis of lymphatic glands in children. Calmette, however, points out that human tuberculosis is common in some countries where bovine tuberculosis is absent.

Problem of Immunity against Fresh Infection.

It is an important question how long persons who have successfully resisted tuberculous infection, and in whom all the invading tubercle bacilli have died out, retain any specific immunity towards fresh infections with living tubercle bacilli. Animal experiments suggest that this period is not long, and that successful specific preventive treatment, if any is possible, can be carried out only with cultures of living bacilli (in measured doses, and possibly attenuated) and not with any vaccine obtained from dead cultures.

The grave and fatal forms of pulmonary tuberculosis, occurring in young adults (and later on), which constitute the majority of cases of "consumption" seen in hospitals, are explained as due to dissemination (possibly during a period of temporarily lowered resistance) from a latent tuberculous focus left from an infection in childhood, or else as due to massive reinfection[5] in an enfeebled individual, or in an individual whose specific resistance to tuberculosis has been lowered as a result of all the tubercle bacilli from his initial infection in childhood having died out. The specific power of resistance to tuberculosis can certainly not be measured by the general state of the health. Analogously, during the last severe influenzal epidemic some strong and robust individuals rapidly succumbed to influenzal pneumonia, whereas, apparently weak and chronically diseased individuals, though similarly affected, recovered. It is well known that a strong healthy native of some primitive community, who has not been exposed to tuberculous infection, may fall a ready victim to the disease on coming into contact with tuberculosis in civilised centres of the world (cf. "Römer's law"). A vigorous man with a latent quiescent tuberculous focus may suffer from grave or fatal tuberculosis if massive dissemination occurs as a result of some chance contusion.[5]

The reason why the ordinary pathological-anatomical features of tuberculosis in adults of civilised communities differ from those most frequent in children and in natives of hitherto non-tuberculous regions of the world (on being brought to centres of civilisation) is now explained as being partly due to relative immunity and reactive power acquired by most persons through tuberculous infection in childhood. In this connexion one may note that there is probably some antagonistic relationship between ordinary lupus (or other relatively mild forms of tuberculosis) and grave pulmonary tuberculosis, in so far as patients suffering from ordinary lupus seldom fall victims to grave forms of pulmonary tuberculosis, unless they already suffer from the pulmonary disease before the lupus shows itself. In fact, patients with lupus generally appear to be resistant to the rapidly progressive forms of tuberculosis. When a patient has tuberculous infiltration in the upper part of the larynx, the tuberculous disease usually, I believe, proves fatal unless it is a case of lupus. This is quite in accord with the view that lupus is due to the bovine type of tubercle bacillus rather than to the human type.

In most cases, as previously mentioned, the initial tuberculous infection in childhood is doubtless overcome by the natural vital mechanism of resistance in the body, but tubercle bacilli probably generally remain alive for a long while, though latent and more or less encapsuled, in various parts of the body, for instance, in lymphatic glands. These bacilli are certainly not always effectually imprisoned, but may keep up a kind of guerilla warfare against their host by occasionally entering his blood-stream (temporary "tuberculous bacillæmia") from their fibrous fastnesses; and during such "raids" they may do serious or fatal mischief, for instance, by setting up tuberculous meningitis. Owing to such a condition of temporary tuberculous bacillæmia (which may be clinically supposed to be an "influenzal attack" or some passing febrile infection of unknown nature) an apparently non-tuberculous subject—in reality, a case of latent or "closed" tuberculosis—may disseminate tubercle bacilli in his secretions (Calmette), just as a tuberculous cow may secrete milk containing tubercle bacilli, even in the absence of any recognisable mammary tuberculosis, and (in animal experiments) tubercle bacilli may pass out in the bile without there being any obvious tuberculous lesion in the liver.

In this connexion I take it that temporary conditions of primary or secondary tuberculous bacillæmia (the "typho-bacillosis" of Landouzy, Léon Bernard, Armand-Delille, &c.) are much more common than is generally supposed—that these cases are often passed by as febrile attacks of unknown origin—that, though death may result owing to tuberculous meningitis, &c., the natural resistance of the body at the time is often sufficient to overcome the bacillary invasion—that in some cases the disseminated tubercle bacilli are able for a time to live and increase locally in various parts of the body, giving rise to attacks of miliary tuberculous pleurisy (including many cases of ordinary subacute and chronic pleurisy) and miliary tuberculous peritonitis, which are often more or less spontaneously recovered from. It is thus that attacks of tuberculous peritonitis would in many cases have been recovered from without having been recognised, had not a surgical operation for suspected disease of appendix or pelvic organs, or (as I have known) for the treatment of hernia, unexpectedly revealed the presence of

peritoneal tubercles. In the same way a temporary tuberculous bacillæmia may lead to the development of single or multiple tuberculous foci in various parts of the body—lungs, bones, urogenital organs, choroid tunic of the eye, &c.—which may or may not ultimately (directly or indirectly) give rise to grave trouble. A minute subpleural tuberculous focus, arising in the same way, may become quiescent or obsolete, and yet (as I shall further on endeavour to explain) subsequently give rise to an attack of pneumothorax.

INFLUENCE OF OTHER DISEASES ON TUBERCULOSIS.

Besides the general conditions of nutrition and specific immunity already referred to as favouring or opposing tuberculosis, the latter disease may be influenced by other diseases. I discussed the evidence on this subject in 1904, in a paper on the "Relations of Tuberculosis to other Diseases,"[7] and since that time I have, of course, observed other illustrative cases and have collected many additional references on the subject, which, however, I cannot fully enter into here.

Diabetes; Syphilis, &c.

The condition of the blood in diabetes mellitus, when there is hyperglycæmia, has been supposed to favour the growth of tubercle bacilli,[8] and the emaciation due to the severer forms of the disease has been supposed to lower the general resistance of the body towards tuberculosis and some other infections. But the severer forms of diabetes mellitus occur especially at youthful ages, when grave pulmonary tuberculosis is likewise rather frequent, and the less severe forms of diabetes mellitus in older persons seem to be by no means specially associated with tuberculosis. The wasting due to diabetes insipidus has been similarly supposed to favour pulmonary tuberculosis, but in certain cases the diabetes insipidus itself has seemed to be caused by tuberculosis in some way affecting the posterior lobe of the pituitary gland.[9] Syphilis, by producing a condition of cachexia, is said to favour tuberculosis, but syphilis is often unaccompanied by any cachexia, and I am by no means satisfied that it always increases the gravity of tuberculosis when both diseases are present together. True syphilitic cachexia is, I think, relatively rarely seen nowadays. It is, indeed, astonishing to note how generally "well-nourished" old syphilitics often appear. Septic counter-infections apparently favour the re-awakening and dissemination of old tuberculous foci, as traumatism[10] (contusions, &c.) may also do. I am inclined to think that the presence of old quiescent tuberculous pulmonary lesions of moderate degree does not greatly increase the gravity of attacks of pneumonia and the pulmonary complications of epidemic influenza, if the influenzal infection does not re-activate the tuberculous lesions. There is a general idea that alcoholism diminishes the resistance of the body towards tuberculosis. Broken-down alcoholics furnish favourable soil for the extension and dissemination of tuberculosis within the body, but doubtless the effect of alcoholism in regard to tuberculosis is largely an indirect one—connected with neglect of (or want of) general hygienic conditions, poverty, &c. Unfortunately, the young children of alcoholics may be adversely affected by the same indirect influences, and become thus likewise predisposed towards tuberculosis, because of their alcoholic parentage.

Hepatic Cirrhosis.

The relation of tuberculosis to hepatic cirrhosis in human beings has been the theme of many clinical and pathological reports; and investigations—chiefly experimental—in animals have been undertaken to elucidate the subject, a subject which was concisely summed up by Sir H. D. Rolleston in 1912.[11] The published literature would fill a large volume, but an elaborate analysis of it was made in 1914 by S. Schönberg,[12] who also contributed some original work of his own. It is probable that tuberculosis, as well as many toxic conditions, especially those directly and indirectly due to alcoholism, favour the development of cirrhosis of the liver. But various forms of hepatic cirrhosis, with or without jaundice,[13] may be a direct result of a chronic tuberculous process within the liver itself, associated with tuberculosis in the territory of the portal circulation or elsewhere in the body. For the development of cirrhotic changes a local vital conservative reaction is, of course, necessary. When the liver is unusually deficient in resistant power, obvious macroscopic caseous changes may occur, and, as is well known, in terminal cases of miliary tuberculous dissemination it is usual to find tubercles present on microscopical examination of the liver. A tuberculous cirrhosis may result when the tissues are very resistant towards the tubercle bacilli, or when the latter are few in number or of low virulence.[14] In connexion with tuberculosis a terminal toxæmic jaundice with hepatic atrophy occurs in rare cases.[15]

This subject is connected with that of the rôle of alcohol in the production of hepatic cirrhosis. Chloroform and various other toxins have been proved, by experiments on animals and by accidental occurrences in human subjects, to injure the liver so as, in "massive doses," to give rise to acute or subacute necrotic parenchymatous changes—and probably, under certain circumstances, to bring about chronic cirrhotic changes—for instance, if administered in smaller repeated doses (that is to say, when chronic reactionary processes are set up in the tissues). Undoubtedly, alcohol is one of those toxins which can injure the liver (though probably its injurious effects vary in different individuals), but its direct rôle in the production of cirrhosis has been over-estimated. Cirrhosis of the liver may arise, altogether independently of alcohol, from various known and unknown causes. On the other hand, alcoholism probably tends to diminish the resistance of the hepatic tissue (as if it dulled the sensitiveness of the cells and lowered the rapidity of their reaction) towards various pathogenic microbes, including tubercle bacilli, and enables the microbes to remain alive in the liver and thus (when not virulent enough to cause extensive cell-necrosis), to set up chronic reactionary inflammatory and sclerotic changes. Alcoholism is now becoming much less frequent in most parts of the world, and the effect of this circumstance on the frequency and types of hepatic cirrhosis will furnish an interesting and important field for future observation and investigation. As the rôle of alcohol becomes less and less, the other factors in the causation of cirrhosis will probably become more manifest.

Hodgkin's Disease; Heart Disease, &c.

In spite of the view that Hodgkin's disease (lymphogranulomatosis maligna) is intimately—and perhaps causally—allied to tuberculosis, I do not think the obtainable clinical and pathological evidence and the ordinary experience of hospital physicians point to much real relationship between the two diseases. The two diseases may certainly be both present together, because Hodgkin's disease often shows itself in early adult life when grave pulmonary tuberculosis is common. Neither do I think that there are any special relations between tuberculosis on the one hand and the various forms of carcinomata and sarcomata on the other, though carcinomata most commonly occur in persons beyond the period of life at which grave tuberculosis is most frequent. In regard to heart disease everyone must admit that pulmonary tuberculosis in an active stage is very seldom found (clinically or by post-mortem examination) in persons with mitral valve disease and chronic passive hyperæmia of the lungs,[16] but the supposition that patients with congenital pulmonary stenosis who reach the age of puberty mostly die from pulmonary tuberculosis is probably incorrect. In former times the latter patients were doubtless often kept, as many chronic invalids, under unhygienic conditions (in insufficiently ventilated rooms, &c.), specially favouring the onset of pulmonary tuberculosis. At present they not rarely die from super-added malignant endocarditis. In connexion with this subject it must not be forgotten that heart disease in rare cases is due to an active cardiac tuberculosis.[17]

Gout; Renal Disorders.

Active pulmonary tuberculosis is seldom found in gouty subjects or associated with true granular kidney, though at post-mortem examination in such cases fibrotic patches in the lungs may point to a active tuberculous disease having been formerly

present and having been successfully overcome. Many medical men have supposed that gout is antagonistic to, or retards, pulmonary tuberculosis,[18] and it seems that a genuine antagonism of the kind exists. In this connexion it may be remembered that according to life assurance inquiries, &c.,[19] "normal weights" and "over-weights" are less likely to die from tuberculosis than "under-weights," and so-called over-feeding probably in some cases both favours the development of gout and opposes pulmonary tuberculosis. However, the prognostic significance of "under-weight" in regard to the danger of developing active tuberculosis is much less in the second than in the first half of life. Under-weight may, moreover, sometimes be a chief clinical sign of the actual existence of, not merely of predisposition to, tuberculosis.[20] Equally complicated is the question of a relationship of pulmonary tuberculosis to habitually low brachial systolic blood pressure, relative cardiac hypoplasia, and the so-called "drop-heart" (as seen in Röntgen photographs of the thorax). Does the actual presence of the slighter forms of tuberculosis help to produce such conditions? [21] Albuminuria, chronic renal irritation, and actual chronic nephritis[22] may be due to the passage of tubercle bacilli and their toxins through the kidney. In some such cases, when there is great tissue resistance towards tuberculosis, miliary tubercles doubtless repeatedly develop in the kidneys and disappear again with or without giving rise to fibrotic changes.

I may mention here that W. H. Dickinson [23] (1875) found tuberculosis in 20·8 per cent. of 250 persons dying from granular degeneration of kidneys, which, according to statistics, was less than the average frequency of tuberculosis at all post-mortem examinations. I myself recorded (1892) that in a series of 145 necropsies on patients over 40 years old with pulmonary tuberculosis (nearly all of whom had actually died from their lung disease) there was evidence of some degree of chronic interstitial nephritis in 40 per cent., whereas, in a series of 44 necropsies on patients over 40 years old with healed or quiescent pulmonary tuberculosis 61·3 per cent. showed evidence of some kind of chronic interstitial nephritis.[24] Amongst the more recent writings on the connexion of chronic interstitial nephritis with tuberculosis those of S. Schönberg,[25] E. Kirch,[26] and O. Kieffer [27] may be especially mentioned. It seems that when tubercle bacilli are passing through the kidneys the resulting reaction and changes (if any) in the kidneys depend (much as the changes under analogous conditions in the liver) on the resistance of the tissues towards tuberculosis and on the number of tubercle bacilli and their degree of virulence. Typical tuberculous changes—macroscopic with caseation, or microscopic tubercles—may result when the tissue-resistance is low or the tubercle bacilli are relatively numerous or of high virulence; whereas cicatricial sclerotic changes (forms of interstitial nephritis) may occur, when the tissue-resistance is great or the tubercle bacilli are few or of low virulence.

In regard to all the above points I am sorry I cannot furnish any elaborate statistics of my own, and there is no time at my disposal in the present lecture to discuss them further. But I wish to explain that probably the most important of the conditions of the body related to tuberculosis are the conditions due to the actual tuberculous process itself—the results of the past fight of the body against the invading tubercle bacilli—especially the presence of encapsuled tuberculous foci and fibrous (cicatricial) areas in the lymphatic glands, the lungs, and elsewhere, pleural and peritoneal adhesions, and (most important of all) a general condition of resistance and partial immunity towards fresh tuberculous outbreaks and dissemination within the body and fresh tuberculous infections from without.

Tuberculides; Pleurisy; Pneumothorax.

Some of the results of these conditions may almost be dignified as "diseases"—for instance, some of the so-called cutaneous tuberculides (if they are really of tuberculous origin) and the renal troubles above alluded to as due to the presence of tuberculosis. Other results may be termed "accidents"—for instance, intestinal obstruction due to adhesions or stenoses resulting from past or chronic tuberculous processes in the mesenteric glands, peritoneum, or abdominal viscera. Modern observations show that very frequently attacks of pleurisy are due to miliary pleural tubercles and that very often the resistance of the body is sufficient to produce a cure. As "accidents" of the kind above referred to I would include nearly all cases of co-called spontaneous or "idiopathic" pneumothorax arising in the apparently healthy.

I first observed a case of this kind in 1899, and the literature on the subject is quite extensive.[28] At least 60 or 70 such cases had been published up to 1903, and since then many cases have been described from time to time in the medical journals by writers, most of whom apparently regarded the condition as one of extreme rarity. The pneumothorax in such cases may arise absolutely spontaneously or there may be some exciting cause such as laughing, coughing, or sneezing. The abnormal physical signs generally disappeared spontaneously within four or five weeks from their onset. In most of these cases I believe that the pneumothorax was due to localised emphysematous changes associated with localised quiescent or healed pulmonary tuberculosis—for instance, to the tearing of a superficial (subserous) bulla, perhaps connected by an adhesion with the opposite (parietal) pleural surface. (I believe that some of the cases of spontaneous pneumothorax, arising in clinically obvious cases of tuberculosis, but rapidly recovered from without liquid effusion or active interference, are due to a similar cause.) H. B. Whitney [29] recorded a case of pneumothorax occurring suddenly in a man, aged 70 years, who was supposed to have suffered formerly from pulmonary tuberculosis. On account of severe pressure symptoms the pneumothorax was tapped and a cannula was left in the chest for several days. Complete recovery followed. A superficial emphysematous change or a pleuritic adhesion, associated with chronic or obsolete tuberculous lesions, afforded the most reasonable explanation for the occurrence of pneumothorax in such a case. In support of this view Dittrich's case might be abduced.[30] It was that of a medical man, aged 28 years, who had quiescent pulmonary tuberculosis. Whilst walking he was suddenly seized with fatal left-sided pneumothorax, which the post-mortem examination showed to be caused by rupture of a subpleural emphysema-bulla situated in a portion of the lung (apex) showing cicatricial changes. It was long ago pointed out by A. Brünnicke, of Copenhagen,[31] that emphysematous changes might in certain cases be regarded as a connecting link between tuberculous lesions and pneumothorax; and it is noteworthy that in some such cases, in which pneumothorax has appeared to be due to the rupture of an emphysema-bulla, the emphysematous change has been found, not in the lower part of the lung—its favourite site in cases of ordinary pulmonary emphysema—but in the upper part, at or near the apex, in which position it is often associated with obsolete or quiescent tuberculous lesions. Thus, in a case of fatal hæmo-pneumothorax, described by G. Newton Pitt,[32] the cause was apparently the rupture of an emphysema-bulla near the apex of the right lung, but the bulla was adherent to the chest wall, and it seems to me that the existence of both adhesion and bulla in this case may very likely have been due to a former minute tuberculous lesion. Examples of pneumothorax due to the tearing of a superficial (subpleural) bulla fastened by an adhesion to the opposite (parietal) pleural surface are to be found in F. W. Zahn's paper of 1891.[33] In this connexion W. H. Ranking's case[34] may likewise be referred to, though it has often been quoted in support of a different view. It was that of a young man, aged 19 years, who, while at church, was suddenly seized with the symptoms of left-sided pneumothorax. The pneumothorax was gradually recovered from

within two months, but later the patient died suddenly from the effects of a dissecting aneurysm of the aorta. At the necropsy the lungs were found free from tubercles, but there were some dilated air-cells, *especially near the apex of the left lung.* Here, again, it must be remembered that emphysema-bullæ near the apex of the lung (especially in the young) are likely to be connected with a cicatricial tuberculous process. In short, it seems that most cases of "spontaneous pneumothorax arising in apparently healthy persons," and certain cases (rapidly spontaneously recovered from) arising in persons with clinically obvious tuberculosis, are late or accidental results of a cicatricial reaction to a local process. They are (rare) "accidents" directly connected with the normal healing process, by which most (if not all) of us in civilised communities have to resist the invasion of our bodies by tubercle bacilli. The prognosis in most cases is good, both in regard to the pneumothorax and in regard to the tuberculosis; for in most cases the tuberculosis has already been practically overcome by the time that the "accident" in question occurs.

CONCLUSION.

I ought perhaps to apologise for having made the title of this lecture so widely inclusive. Indeed, the relation of tuberculosis to various general conditions of the body includes a consideration of the various clinical forms of tuberculosis in relation to the specific resistance of the body towards tubercle bacilli (both the human and bovine types), and, therefore, also the relations of pulmonary tuberculosis to lupus, tuberculosis of the lymphatic glands, &c.; the whole subject of "scrofulosis"; and also the relations of pulmonary tuberculosis to local disorders and "accidents" connected with the resistance of the tissues to local tuberculous foci. I have merely been able to sketch the subject in this lecture. I have practically not entered into the question of the relations of tuberculosis to the so-called cutaneous tuberculides and the various other skin diseases which have, by certain writers, thought to be (at all events, sometimes) ætiologically in some way connected with tuberculosis. In regard to the single subject of the relatively rare cases of spontaneous pneumothorax occurring in apparently healthy persons a volume could be filled by short descriptions and an analysis of the 200 cases or more that have already been published.

The general trend of my remarks may be summarised as follows:—

1. That one of the most important connecting links between tuberculosis, especially pulmonary tuberculosis, and various general conditions of the body and local diseases and "accidents" in various viscera, is the state of the patient resulting from the tuberculous infection itself, either through its toxins or through the local presence of tubercle bacilli, and through the local and general reactive processes by which the body more or less successfully opposes or overcomes the bacillary parasitic invasion.

2. That it is only with the help of such relative processes of resistance, which may be greatly favoured and encouraged by general and special antituberculosis hygiene, that the human race can hope eventually so far to gain the upper hand that tuberculosis may very largely lose its character as one of the most frequent causes of death and disability.

3. Occasional visceral and cutaneous diseases and "accidents," of which I have taken "spontaneous pneumothorax arising in apparently healthy persons"—though relatively rare—as a type (and have therefore dealt with it at slightly greater length than the others), should be regarded as tokens of the price which we may be called on to pay if our struggle against tuberculous infection is, on the whole, effectual.

References.

I have referred to very few authors out of the immense number whose work deals with the subjects of my lecture. I take it that many of the omitted names of authors are household words to medical men interested in the subject. My own writings which I have quoted can be consulted for some of the numerous references that I have failed to give here.

1. Cf. the various speakers at the Second Conference of the International Union against Tuberculosis, London, July, 1921; abstract in THE LANCET, 1921, ii., 301. Cf. also the Special Discussion on Eradication of Tuberculosis from Man and Animals, at Roy. Soc. Med., Lond., March, 1921 (Sir John McFadyean and others), Proc. Roy. Soc. Med., 1921, xiv., 11–25.

2. F. Parkes Weber: Congenital Tuberculosis—A Survey, Brit. Jour. Child. Dis., Lond., 1916, xiii., 321–332 and 359–368.

3. Cf. G. H. Lancashire: On the Association of Skin Tuberculosis with Visceral and Other Tuberculous Manifestations, Brit. Med. Jour., 1921, ii., 551–553.

4. Cf. F. Parkes Weber: A Note on Calmette's Ophthalmo-Reaction, Medical Press, London, 1908, cxxxvii., 166.

5. Cf. G. W. Norris and H. R. M. Landis: Diseases of the Chest, 1920, p. 306 ("Reinfection in Tuberculosis").

6. Cf. F. Parkes Weber: Traumatic Pneumonia and Traumatic Tuberculosis, London, Adlard, 1916.

7. F. Parkes Weber: THE LANCET, 1904, i., 924–928.

8. Cf. Nathan Raw: The Influence of Diabetes and Gout on the Tuberculous Infections of the Human Body, Trans. Med. Soc. Lond., 1911, xxxiv., 261–266.

9. Cf. F. Parkes Weber and H. Schmidt: Diabetes Insipidus with a Peculiar Necropsy Finding in the Posterior Lobe of the Pituitary Gland, Amer. Jour. Med. Sci., Pa., 1916, cliii., 892.

10. Cf. F. Parkes Weber: Traumatic Tuberculosis, Clinical Journal, 1916, xlv., 249; T. D. Lister: Industrial Tuberculosis, THE LANCET, 1910, ii., 1122.

11. Sir H. D. Rolleston: Diseases of the Liver, second edition, London, 1912, 345–348.

12. S. Schönberg: Lebercirrhose und Tuberkulose, Ziegler's Beiträge z. path. Anat. u. z. allg. Path., Jena, 1914, lix., 601–673.

13. J. M. Cruice: Jaundice in Tuberculosis, Amer. Jour. Med. Sci., Philadelphia, 1914, cxlvii., 720–726.

14. Cf. E. Kirch's elaborate critical study, Ueber tuberkulöse Leberzirrhose, tuberkulöse Schrumpfnieren und analoge Folgeerscheinungen granulierender tuberkulöser Entzündung in Pankreas und Mundspeicheldrüsen, Virchow's Archiv, 1918, ccxxv., 129–195.

15. F. Parkes Weber: Toxæmic Jaundice with Hepatic Atrophy in Connexion with Tuberculosis, St. Bartholomew's Hospital Reports, London, 1908, xliv., 55–59.

16. Cf., however, G. W. Norris, Tuberculosis and Heart Disease, Amer. Jour. Med. Sci., Pa., 1904, cxxviii., 649–668.

17. In England only a few cases of cardiac tuberculosis have been reported. Cf. W. O. Meek: Tuberculous Endocarditis, Proc. Roy. Soc. Med., Pathological Section, 1908, i., 116; Fawcett's case, Guy's Hospital Gazette, London, 1911, xxv. 549 (Case III.); P. Bahr and G. C. Low: Tuberculosis with Special Involvement of the Heart, THE LANCET, 1912, i., 362; W. J. McKeand and D. McKinlay Reid: Large Caseous Tubercle of the Myocardium, THE LANCET, 1912, ii., 693; T. H. and H. O. Gunewardene: Extensive Primary Tuberculous Disease of the Heart, Proc. Roy. Soc. Med., Section for Study of Diseases in Children, 1920, xiii., 38; W. W. Adamson: Tuberculosis of the Myocardium, Jour. Path. and Bact., Cambridge, 1920, xxiii., 399.

18. In England, Dr. J. E. Pollock, Sir Dyce Duckworth, Sir Hermann Weber, &c.

19. Cf. F. Parkes Weber and W. R. Kirkness: A Note on Body-Weight in Relation to Pulmonary Tuberculosis, Brit. Med. Jour., 1909, i., 142.

20. Cf. H. Batty Shaw: Body-Weight in Adult Consumptives, Clinical Journal, London, 1920, xlix., 127.

21. Cf. Reinhold Nauclér's discussion: Ueber den Blutdruck bei Lungentuberkulose, Acta Medica Scandinavica, 1920, lii., 271–310.

22. I need not allude to amyloid disease here. Amyloid disease of great degree is at the present time rarely seen in connexion with tuberculosis, but lesser degrees of amyloid change in the kidneys are not infrequently present in the later stages of chronic pulmonary tuberculosis.

23. W. H. Dickinson: Diseases of the Kidney, London, 1875, 378.

24. F. Parkes Weber: On the Association of Chronic Interstitial Nephritis with Pulmonary Tuberculosis (Cambridge M.D. Thesis), printed by J. Bale and Sons, London, 1892, 7 et seq.

25. S. Schönberg: Ueber tuberkulöse Schrumpfnieren, Zeitschrift f. klin. Med., Berlin, 1913, lxxviii., 371–386; also Idem, Ueber tuberkulöse Schrumpfnieren, Virchow's Archiv, 1915, ccxx., 285–294.

26. E. Kirch: Loc. cit.

27. O. Kieffer: Zur Klinik und Pathologie der Nierenerkrankungen im Verlaufe der Lungentuberkulose, Zeitschrift für Tuberkulose, Leipzig, 1920, xxxiii., 9–23, 65–77, 137–148.

28. F. Parkes Weber: Pneumothorax without Effusion in an Apparently Healthy Man, Trans. Clin. Soc. of London, 1900, xxxiii., 171. Cf. F. Parkes Weber: The Clinical Forms of Pneumothorax, especially Pneumothorax in Pulmonary Tuberculosis and Pneumothorax arising in Apparently Healthy Persons, Zeitsch. für Tuberkulose, 1903, iv., 477–491; Arrested Pulmonary Tuberculosis, ibid., 1904, v., 214; Pneumothorax in Tuberculous Subjects, THE LANCET, 1905, ii., 813–817; and Some Unusual Cases of Spontaneous Pneumothorax, Practitioner, 1919, ciii., 190–198.

29. H. B. Whitney: Philadelphia Medical Journal, 1899, iii., 93, Case 2.

30. Dittrich's case was first published by Dr. M. A. Wintrich, in his Krankheiten der Respirationsorgane, Erlangen, 1854, 352.

31. A. Brünnicke: English translation in the Dublin Hospital Gazette, 1856, iii., 3.

32. G. Newton Pitt: Trans. Clin. Soc. Lond., 1900, xxxiii., 95.

33. F. W. Zahn: Virchow's Archiv, 1891, cxxiii., 197.

34. W. H. Ranking: Brit. Med. Jour., 1860, 665.

VITAMIN DEFICIENCY AND FACTORS IN METABOLISM

RELATIVE TO THE DEVELOPMENT OF RICKETS.

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I HAVE followed with keen interest recent controversy on the position of the fat-soluble vitamin as a factor in the causation of rickets. The work of Mellanby[1] has established that experimental rickets in puppies can be produced by a vitamin deficiency in the diet. Further, recent workers in America—McCollum, Simmonds, and Pitz[2]—have produced rickets experimentally in rats by diets deficient in other single factors—viz., low calcium content, poor quality of protein, and unsatisfactory salt combinations. Other workers emphasise the influence of confinement and laboratory conditions upon the health of the experimental animal.[3,4] This is not without importance in view of the opinion that confining conditions of modern civilisation, especially conditions in large towns, are at least predisposing factors in the development of the disease. There remains great enthusiasm in experimental circles for the deficiency theory of rickets; the theory is likely to become the more generally popular, outside those circles, because the step from the popular conception of a fat deficiency in rickets to the deficiency of a fat-soluble vitamin is an easy one. On the clinical side, interesting results have recently been published by Dr. Corrie Mann, Dr. Elsie Dalyell, and others.[5] It must be observed, however, that the work of Hess and Unger referred to by Hopkins [6] as a "clinical experiment," and perhaps the most valuable clinical contribution to date, is unfavourable to a vitamin theory of rickets.

It is now rather over one year since I began to keep exact records of cases of rickets in infant welfare clinics in the city of Liverpool, primarily with a view to checking and coördinating my own ideas on the subject. I will briefly state the results shown.

Results of Records of Cases in Infant Welfare Clinics.

Rickets occurs on every type of dietary, even on the breast alone, with no evidence that the natural supply is insufficient or unsatisfactory, and equally on an artificial diet of an entirely irreproachable character. One hundred and twenty cases were collected; of these 80 were breast-fed up to at least six months, 60 for a normal period (eight months to one year). The following table shows the occurrence of various foods in the dietary of rachitic children in this series when brought to the clinic:—

Cows' milk or modified cows' milk, including Corporation sterilised milk, 14	51
Full cream dried milks, Glaxo 22, Cow and Gate 1	23
Condensed milk (Nestlé's)	16
Neave's food	6
Allenburys' food	7
Savory and Moore's food	3

It is certain that war conditions and post-war prices, with the scarcity of animal fats, have extended the possibility of a vitamin deficiency, more particularly of the fat-soluble vitamin in the diets of a large section of the British public. I personally came to the conclusion that such a deficiency in the diet is not specially associated with rickets in a majority of cases. While certainly so associated in a proportion of the cases, it is equally a feature of the dietary of other children who do not suffer from rickets.*

* It is argued, of course, that if we assume an accessory factor responsible for growth, deficiency of which factor is responsible for rickets, a normal supply becomes a deficiency in the more rapidly growing children. This would be an adequate explanation of one of my cases—otherwise inexplicable except from the point of view of individual metabolism—a case occurring in one of twins who had been identically reared and fed. The better grown of the two was rachitic, the other was normal. The diet of these children had been unsuitable and inadequate, owing to extreme poverty, but not obviously deficient in fat-soluble A, as fresh country milk (1½ pints only daily between the two) had been furnished by the Liverpool Invalid Children's Association, and malt and oil supplied regularly to both children from the clinic

While the character and chemical nature of the fat-soluble vitamin remain obscure or a matter of contention, and with its distribution as yet inadequately worked out, it is admittedly difficult to dogmatise as to its presence in or absence from dietary. Following the work of Hopkins and others,[7] rather than that of Drummond[8] recently published, I am assuming that the fat-soluble vitamin is relatively thermostabile. I have thought it safe to infer that this accessory factor is adequately present both in home-sterilised or pasteurised milk, and in the rapidly heated dried milks of the Just-Hatmäker or cylindrical process, but less generally so in the condensed variety of milk. In the case of slightly older children one may assume that a good supply of the factor is furnished by a diet containing butter, or cream, eggs, fresh country whole milk—especially if freely supplemented by such substances as virol or cod-liver oil. In the case of the breast-fed child the diet of the mother must contain a sufficiency of such substances and of green vegetables.

Consideration of Diets Received.

On these lines, I came to the conclusion that of 120 cases 64 had received a good supply of so-called anti-rachitic factor; of these, upwards of 30 had been taking virol or cod-liver oil sufficiently long for some degree of prophylaxis to be anticipated.[9] Twenty cases had definitely *not* received an adequate supply of vitamin. On the remaining 36 cases I found it impossible to arbitrate, the reason being that the source of the milk-supply in these cases was unknown. I must explain that a proportion of the Liverpool milk-supply is from fodder or meal-fed cows, kept in cow-sheds within the city. This milk, which is naturally fresher, is much sought after for infants as opposed to "railway milk." It is obviously deficient. As regards butter, owing to the generally persisting prejudice against margarine in the class to which these children belonged, many of the very poorest of them had received a ration of butter in their diet, whatever else they had gone without. Various faults in dietary were from time to time identified, but no constant common peculiarity between the cases could be established. There was, however, a history of abnormal appetite, accompanied by very definite over-feeding in a fair proportion of the cases. This is compatible with the opinion expressed by Hess and others—more commonly held in America than in this country—that rickets is apt to be associated with an *excess* rather than a *deficiency* in dietary. There would appear to be a relationship between the fulfilment of energy requirements—in which both dietary and hygiene are concerned as a law of supply and demand—and the development of rickets. A history of infection, with subsequent development or marked exaggeration of rachitic phenomena, was present in a much larger number of cases than I should have anticipated. Thus 36, out of 120 cases, had a history of infectious disease, often of one infection following on another, whereas other debilitating conditions, which may have been predisposing or contributory, were present in 32 cases, as follows:—

Measles	5	Gastro-intestinal conditions	14
Whooping-cough	5	Adenoids and otorrhœa	5
Chicken-pox	1	Infantile paralysis	2
Scarlet fever	2	Operations, harelip, and intussusception	2
Pneumonia	10	Tuberculosis, family history	3
Measles and whooping-cough	6	Furunculosis and eczema	2
Measles and chicken-pox	1	Scurvy	2
Measles, chicken-pox, and whooping-cough	4	Syphilis	1
Whooping-cough and influenza	1	Bright's disease	1
Whooping-cough and diphtheria	1		
Total	36	Total	32

I came finally to the conclusion that while errors of hygiene[10] and dietary and debilitating conditions generally were incidental, probably predisposing to the development of rickets, there must be some common determining factor still to be found, of which no obvious clinical or bacteriological evidence was in existence. It may be possible to trace some positive error in

metabolism, such as may be caused—possibly in common with other factors—by a vitamin deficiency in the diet.

The *modus operandi* in the case of the various vitamin deficiencies is still a matter of discussion. It has been suggested that there may be an aberrant metabolism of carbohydrate, in the absence of a particular vitamin. Alternatively, acidosis has been several times claimed to exist in connexion with deficiency disease, notably scurvy [12] and beri-beri.[13] I have been attracted by the somewhat picturesque suggestion of Dr. Eric Pritchard[14] that, in rickets, calcium ("available base") is withheld from developing bone, since it becomes more urgently required to neutralise acid products of incomplete oxidation. It is subsequently excreted in combination, and thus lost to the system. So also with magnesium and sodium of nervous and muscular tissues. I do not suggest that in rickets lime salts are actually dissolved out of bone, though indeed this must happen in osteomalacia, and perhaps also in adolescent rickets.

Probable Compensated Acidosis in Rickets.

The hydrogen-ion concentration of the blood has been shown to be normal in rickets, but the assumption is that a compensated acidosis is present, in that there is a lowering of the alkaline reserve of the organism. According to Haldane[15] the term used is a misleading one. The deviation from the normal in the hydrogen-ion concentration is actually too small to be observed by known physical and chemical methods. It can, however, be shown by the far more delicate method of observation of the accompanying changes in breathing, and in the excretion of acid or alkali and of ammonia by the kidneys.

In the case of rickets, the clinical findings previously referred to, as regards both excess feeding and the association of debilitating conditions with the histories of rachitic children, appear favourable to the existence of such a condition. Hyperpnœa, the obvious clinical manifestation of increased CO_2 output consequent on the presence of abnormal acid in the circulation, is certainly present in the acute crises of rickets. It occurs also in the spasmophilia and respiratory catarrhs associated with milder cases. The fact that such symptoms are entirely absent over intervening periods would point to the underlying condition being an intermittent or recurring one, of very varying intensity at different periods. This is borne out in the variations found from day to day in work on the calcium metabolism.

Dr. Engel[16] has recently chronicled cases of rickets in Germany, permanently dyspnœic, and dying with symptoms of acute air-hunger. There is, further, in rickets an increased urinary excretion of phosphates,[17] suggesting that an increased proportion of mono-sodium phosphate, relative to di-sodium phosphate, is being excreted for purposes of blood equilibrium. Dr. Pritchard's suggestion is further substantiated by the excretion of creatine in the urines of rachitic children.[18] This phenomenon has been shown by Underhill to occur in conditions of acidosis in absence of defect in carbohydrate metabolism.[19] Since creatine may be regarded as a substituted guanidine the recognition of guanidine as the toxin factor in tetany is of importance [20]; the injection of guanidine into rabbits with the production of tetany has been shown by Watanabe to be associated with acidosis.[21] Some degree of acidosis is without doubt present in both tetany and osteomalacia.[22] As regards blood-calcium depletion the condition in tetany would appear to be an exaggeration of the condition in rickets.[23]

A careful study of work on the calcium metabolism in rickets reveals nothing to negative Dr. Pritchard's view. The outstanding feature of the disease must be said to be an inability to use the calcium salts; the greater number of cases in my series developed rickets on a diet of cow's milk, containing a large excess of calcium compared with human milk. Unfortunately, it is impossible to distinguish between deficient absorption and true excretion in the calcium loss in the stools. There is no disturbance of fat metabolism; fat-splitting is adequate and normal.[24] Steinitz, Langstein and Meyer [25] identified fatty-acid excretions with loss of mineral constituents akin to the loss in rickets, with conditions of acidosis in young children suffering from gastro-intestinal disease, and showed an increased ammonia ratio in such cases.

Comparative Investigations into Urines.

With the object of deciding whether or no rachitic children were suffering from a lowering of their alkaline reserve (whether from the cause indicated by Pritchard or from some other cause) I decided, on the advice of Prof. W. Ramsden, to compare the urines of a series of rachitic children with those of normal children of the same age as to the proportion of nitrogen excreted as ammonia relative to total nitrogen excretion—and at the same time (or just subsequently) directly test their alkaline reserve, on the method of Sellard, Henderson and Palmore, by noting the amount of bicarbonate of soda dosage necessary to change the reaction of the urine (acid to alkaline).

The difficulties of the task I set myself were obvious; in the first place it was likely to be difficult to obtain urinary specimens from such young children, of the training and habits of the class indicated. Secondly, it was only possible to obtain such specimens in hospital, or some other available institution, where the main difficulty was to find an adequate number of children whom I could pass as sufficiently healthy to use as controls.

In all 65 children were investigated, comprising 30 rachitic children (healed, active, or recovering), 25 healthy children of the same class (controls), and 10 unhealthy children of the same class, not rachitic (further controls).

The children on the first list of controls (healthy children) were selected by me personally in two of the Liverpool Day Nurseries, to which I was admitted by kindness of Dr. Ruby McBirnie, infant welfare officer for the City of Liverpool. I was fortunate in securing almost complete 12-hourly specimens (the children went home at night) for my ammonia ratio estimations, in a majority of cases. In others it was only possible to take a mean of separate estimations on morning and evening specimens—as had to be done subsequently with the hospital children in a majority of cases. The rachitic children, with one or two exceptions, were in-patients at the Leasowe Hospital for Children (annexe for rickets and wasting babies), as also were the unhealthy controls. This second control list was undertaken for the purpose of ascertaining whether or no there was a distinction between this type of child and the rachitic child in the state of the alkaline reserve, the ammonia ratio being high in each case.

Method of Procedure.

The method of procedure with the bicarbonate of soda dosage was as follows: On the first day a normal afternoon specimen of urine was obtained and tested as to reaction to litmus (usually acid), titration acidity and ammonia content per 100 c.cm. On the second day gr. v. sodium bicarbonate was given three times between the hours of 9 A.M. and 3 P.M., and a specimen obtained for examination after 3 P.M., usually about tea time. If the reaction was still acid the dosage was increased to gr. x. three times on the third day, and, if necessary, to gr. xv. and gr. xx. respectively on the fourth and fifth days.

For charting purposes the children were subsequently graded as follows:—

Grade	A	Urine	alkaline	to litmus	from the start.	
,,	B	,,	,,	,,	following	gr. v.
,,	C	,,	,,	,,	,,	gr. x.
,,	D	,,	,,	,,	,,	gr. xv.
,,	E	,,	,,	,,	,,	gr. xx.
,,	F	Urine	still acid,	in spite of	dosage.	

All specimens were carefully preserved; a saturated solution of camphor in chloroform was used throughout for the purpose. Ammonia estimations were carried out by the Sorenson formalin method, immediately following receipts of specimens. For the nitrogen estimations the method chosen was Folin's micro method; this consists of a miniature Kjeldahl with

Nesslerization of resultant ammonia. It was found to be convenient, rapid, and very constantly accurate, controlled by the usual Kjeldahl.

The excretion of acetone bodies, ketosis, is frequently associated with acidosis in supposed disturbance of the carbohydrate metabolism. Wishing to eliminate a possible ketosis as a factor in any condition of acidosis found to be present, we systematically examined all urines, both of controls and rachitic children, for acetone by Rothera's test on the day of the first examination. Acetone was absent in all cases, with the exception of one of the control cases, which was discarded.

Results.

For the purpose of tabulating results the children have been arranged according to age. From the control list of healthy children (Table I.), it will be seen that in the healthy child the ammonia ratio is roughly constant, approximating to the adult proportion of 5 per cent., average 6·2 per cent. The alkaline reserve is graded B or C—i.e., these children originally had an acid urine, but a dosage of gr. v. or gr. x. sodium bicarbonate was sufficient to turn it alkaline. Cols. 5 and 6 are of minor importance. They show the reduction in ammonia content (grammes per 100 c.cm.) under the influence of bicarbonate dosage, from the time of the original specimen until the reaction to litmus was changed. Owing to the varying concentration of urinary specimens from day to day, the comparison for these two columns is not a precise one. Generally speaking, however, there was a reduction of upwards of one-half on the content of the original specimen.

The control list of unhealthy (actually convalescent) children (Table II.) shows a definite increase in the ammonia ratio, which is, of course, known to be a very variable quantity in ill-health in early childhood. Average of this list = 10·5 per cent. Three series of rachitic children are shown: Table III., active cases, 13; Table IV., recovering cases, 14; and Table V., healed cases, 3. For all practical purposes the three children classified as healed rickets in Table V. rank with the controls. The average ammonia ratio was 5·9 per cent. and the grade of alkaline reserve was C. Two of these cases were seen by me just previous to their discharge from hospital, after six months and one year respectively of in-treatment. The third, I. C., was an older child, 4 years, who was admitted for double femoral osteotomy for genu valgum. She was otherwise healthy and normal.

Active Cases.

The series of active cases (Table III.) consists necessarily of the younger children, 8 months to 1 year and 4 months, actually, with acute manifestations of the disease. The clinical condition consisted of flabby musculature, associated with enlarged epiphyses, craniotabes, delayed dentition, sweating about the head, and in many of the cases bronchitis and laryngospasm. P. O'N. and Ch. C.

TABLE I.—CONTROL LIST OF HEALTHY CHILDREN.*

1	2	3	4†	5	6	7†
Child.	Age in years.	Nitrogen content, g. per 100 c.cm.	Ammonia content, g. per 100 c.cm.	Ammonia ratio.	Grade of alkaline reserve.	Reduction in ammonia content. G. per 100 c.cm. during period of dosage.
M. H. ..	8/12	0·77	0·0108	1·4	—	—
J. M. ..	8/12	1·0	0·1156	11·5	B	0·0935 to 0·1496
A. H. ..	10/12	0·84	0·1054	12·5	C	0·1938 ,, ?
D. D. ..	10/12	—	—	—	C	0·102 ,, 0·1411
G. H. C. ..	1 1/12	—	—	—	B	0·1156 ,, 0·0010
H. E. ..	1 1/12	—	—	—	A	0·0136
T. C. ..	1 2/12	1·25	0·0564	4·5	B	0·0714 to 0·0204
F. M. ..	1 2/12	—	—	—	B	0·0530 ,, nil.
E. B. ..	1 4/12	0·28	0·0272	9·7	B	0·0544 ,, 0·0816
C. C. ..	1 8/12	0·99	0·0224	2·5	C	0·0068 ,, 0·0051
E. B. ..	1 10/12	0·8	0·0731	8·2	B	0·0585 ,, 0·0292
D. H. ..	2	0·84	0·0653	7·7	C	0·0748 ,, 0·0258
T. J. ..	2	0·44	0·0292	6·6	B	0·0136 ,, 0·0163
E. L. ..	2	0·42	0·0122	2·9	C	0·0299 ,, 0·0197
S. R. ..	2	—	—	—	C	0·0408 ,, 0·0353
R. H. ..	2 6/12	0·92	0·0374	4·04	B	0·0153 ,, 0·0448
I. M. ..	2 6/12	1·66	0·0115	0·69	B	0·0700 ,, 0·0380
A. W. ..	2 6/12	0·62	0·0469	7·5	B	0·0272 ,, 0·0142
J. W. ..	2 10/12	0·68	0·0429	6·2	B	0·0306 ,, 0·0204
J. W. ..	3	—	—	—	B	0·1475 ,, 0·0333
T. W. ..	3 3/12	0·98	0·0707	7·2	B	0·3451 ,, 0·0040
M. F. ..	3 3/12	0·96	0·0816	8·5	B	0·085 ,, 0·0251
J. S. ..	3 4/12	1·04	0·0156	1·5	B	0·0281 ,, 0·0068
G. McG. ..	4	0·76	0·0493	3·75	C	0·0612 ,, 0·0414
N. McG. ..	4 6/12	0·76	0·0285	3·75	B	0·0085 ,, 0·0374

Average ammonia ratio = 6·2 per cent.
Grade of alkaline reserve, B or C (one exception A).

TABLE II.—CONTROL LIST OF UNHEALTHY CHILDREN.

T. W. *a* ..	10/12	0·92	0·1683	17·3	A	0·2992
L. M. *b* ..	1 2/12	0·82	0·0365	3·6	A	0·0051
J. B. *c* ..	1 5/12	0·97	0·0739	6·9	C	0·1156 to 0·0221
W. M. *d* ..	1 6/12	0·8	0·1071	11·68	C	0·1802 ,, 0·0629
R. E. *e* ..	1 7/12	1·01	0·0884	8·1	C	0·1292 ,, 0·0085
J. M. *f* ..	1 10/12	1·1	0·1496	13·6	B	0·1428 ,, 0·0340
O. J. *g* ..	2	0·82	0·0799	9·8	B	0·0918 ,, 0·0272
D. W. *h* ..	2	1·0	0·0654	6·5	B	0·0578 ,, 0·0187
J. J. *i* ..	2 6/12	1·23	0·1487	12·7	C	0·1904 ,, 0·0799
B. C. *j* ..	2 8/12	0·74	0·1108	14·9	D	0·2601 ,, 0·0313

Average ammonia ratio = 10·5 per cent.
Grade of alkaline reserve, A—C (one case D).
Suffering from *a*, *b*, *c*, marasmus; *d*, *e*, debility: adenoids; *f*, general malnutrition; *g*, tuberculous knee; *h*, septic scalp and glands; *i*, debility; *j*, adenoids, cough.

TABLE III.—RACHITIC CHILDREN. *Active Cases.*

1	2	3	4†	5	6	7†
Child.	Age in years.	Nitrogen content, g. per 100 c.cm.	Ammonia content, g. per 100 c.cm.	Ammonia ratio.	Grade of alkaline reserve.	Reduction in ammonia content. G. per 100 c.cm. during period of dosage.
G. M. ..	8/12	0·82	0·1237	15·1	F	0·0204 to 0·306
E. W. ..	9/12	0·78	0·1197	14·1	F	0·0780 ,, 0·0442
P. O'N. ..	10/12	0·98	0·1173	12·0	F	0·0918 ,, 0·1054
A. M. ..	11/12	0·8	0·2380	29·7	D	0·1411 ,, 0·1292
W. N. ..	11/12	0·69	0·0768	5·9	F	0·0768 ,, 0·1102
M. H. ..	1	0·89	0·1307	8·4	F	0·1224 ,, 0·085
Ch. C. ..	1	1·2	0·2584	21·2	—	—
J. K. ..	1 1/12	1·2	0·1402	11·5	C	0·1802 ,, 0·0969
S. M. ..	1 1/12	0·81	0·0637	7·7	D	0·0867 ,, 0·0578
P. L. ..	1 2/12	1·16	0·1453	7·4	F	0·1207 ,, 0·0901
A. S. ..	1 2/12	0·74	0·2248	30·4	C	0·2244 ,, 0·0408
S. A. ..	1 2/12	0·7	0·094	13·4	D	0·0931 ,, 0·0408
C. C. ..	1 4/12	1·0	0·0986	9·5	D	0·1399 ,, nil.

Average ammonia ratio = 14·3 per cent.
Grade of alkaline reserve, D to F (two cases C).

TABLE IV.—*Recovering Cases.*

J. R. ..	10/12	1·2	0·1376	11·6	B	0·0323 to 0·0030
F. H. ..	1	1·37	0·1516	10·9	A	0·102
E. H. ..	1 3/12	1·0	0·1139	9·9	B	0·1139 to 0·0102
K. K. ..	1 9/12	0·99	0·0714	7·2	A	0·0578
M. C. ..	1 11/12	1·77	0·1315	11·4	B	0·1298 to 0·0653
A. H. ..	2	0·87	0·0680	8·6	B	0·1020 ,, 0·0326
A. S. ..	2	1·47	0·1780	12·6	B	0·1462 ,, 0·0476
E. B. ..	2	0·81	0·22	25·6	A	0·1
I. R. ..	2 3/12	0·96	0·1924	20·0	C	0·0421 to 0·0102
A. M. ..	2 6/12	0·97	0·2193	21·6	A	0·2873
A. P. ..	2 10/12	0·79	0·0766	9·7	A	0·1434
G. A. ..	3	0·94	0·1180	12·7	C	0·1183 to 0·017
E. B. ..	3 3/12	1·48	0·2580	17·2	B	0·1416 ,, 0·0238
W. J. ..	3 4/12	0·84	0·0567	6·5	B	0·0319 ,, 0·0204

Average ammonia ratio = 13·2 per cent.
Grade of alkaline reserve, A or B (two cases C).

TABLE V.—*Healed Cases.*

K. A. ..	1 4/12	0·76	0·0357	4·7	C	0·0357 to 0·0323
S. C. ..	1 11/12	0·76	0·0612	8·0	C	0·0612 ,, 0·0428
I. C. ..	4 4/12	0·68	0·0346	5·1	C	0·0360 ,, 0·0272

Average ammonia ratio = 5·9 per cent.
Grade of alkaline reserve, C.

* In the control cases only partially recorded, owing to their mothers being out of work, the children unfortunately ceased to attend the nursery before the investigation was complete. When, as in the majority of these cases, the investigation of the alkaline reserve had been done first, a week was allowed to elapse before the ammonia ratio was taken, in order that the effects of alkali dosage might wear off.

† Column 4 contains "whole-day" specimens; column 7 contains single specimens taken late in the afternoon (during period of dosage). A few cases curiously show an increase with dosage. This was also the case with many of the cases of active rickets, as though the alkali dosage actually helped them by encouraging their own reaction—i.e., the production of ammonia.

had very definite spasmophilia. G. M. on one occasion at least was seen in tetany. All were cases of uncomplicated rickets with the exception of A. H. (impetigo), A. S. (adenoids), and P. L. (otorrhœa). The majority at one year had no teeth, and were quite unable to raise themselves or to sit up. Most of the children were comparatively recent admissions to hospital. In view of the findings of Frew[26] concerning acetone in a series of cases at the Great Ormond-street Hospital, none of them were investigated during their first week.

Three points have to be considered in a comparison with controls: 1. The ammonia ratio—high in all cases—an average of 14·3 compared to 6·2 in the control list. 2. The condition of the alkaline reserve—reduced—out of 12 children tested, six were grade F, four of these were investigated the second week after their admission to hospital, and may be reckoned "untreated"; the fifth child, W. N., had been in hospital one month; the sixth, G. M., had suffered from tetany. The children graded C and D were either rather older children or cases of a less severe type. 3. The ammonia content (grammes per 100 c.cm.) is less constantly reduced following bicarbonate dosage. This suggests that a high ammonia formation was an essential of the metabolism present, even when additional alkali was supplied.

Recovering Cases.

These were a series of 14 children, slightly older than the active cases, with flabby musculature, bony deformities, and other general stigmata of rickets, usually well-developed. The majority had the more or less typical thoracico-abdominal deformity. They had been in-patients of the hospital for very varying periods—from 14 days up to one year. I believed the condition to be improving in all cases. The ammonia ratio remains high—average 13·2—though not quite so high as in active cases. The alkaline reserve is well established, in some cases above the normal. The urines of five of the children were alkaline on first examination—an alkalosis may be said to be present in these cases. Finally, it occurred to me that a comparison of three children admitted on the same day, two of uncomplicated marasmus, and one of active rickets, might be of interest. The children, of approximately the same age and weight (about half the normal at one year), were: T. W. (marasmus) 10 months, weight 10 lb. 9 oz.; L. M. (marasmus) 14 months, weight 11 lb. 12 oz.; M. H. (rickets) one year, weight 11 lb. 6 oz.

Clinically there was absolute distinction between the case of rickets and those of marasmus. The latter had good, white, well-formed teeth and hard bones; they sat up readily in bed, and could stand with assistance, T. W. at 10½ months. M. H., the rachitic child, had no teeth, and was quite unable to sit up at one year. Of the marasmic children, one—T. W.—had undoubtedly been simply starved. At the end of 14 days he had put on 2 lb., though still thin and miserable; appetite and digestion good and normal. The ammonia ratio in this case was high—17 per cent. The second case, L. M., was a more generally unhealthy child. In this case the ammonia ratio was 3·6 only. The children were together in Grade A of the alkaline reserve. The rachitic child showed acidosis; her reserve was Grade F. There was very little compensatory ammonia formation—ammonia ratio 8·6 per cent.

Remarks.

It is admittedly impossible to dogmatise on the metabolism in rickets from urinary work in a comparatively small number of cases. I do, however, claim that there is sufficient indication of a lowering of the alkali reserve in cases of active rickets for further work to be undertaken, more particularly work on the alveolar CO_2 content, when a satisfactory apparatus can be devised for use with children or from blood examinations, more particularly of the dissociations curve of hæmoglobin.

As regards the ammonia ratio in rickets, I believe this is a very variable quantity, according to the amount of reaction to the disease which is going on. In the most acute cases one finds a lowering of the alkaline reserve associated with a comparatively small ammonia ratio (cases Grade F in Table IV. show such a ratio, compared with other cases in the series). As the condition improves the ammonia content increases, and the alkaline reserve tends to resume the normal. Later the alkaline reserve will have become normal, and active disease is arrested, but the ammonia ratio is likely to remain above the average, so long as any tendency to acidosis persists. This is shown in the recovering cases. Ultimately in healed cases the alkaline reserve and the ammonia ratio are both normal.

It must be admitted that the relationship as to cause and effect between the condition shown and the disease is not clear. It is impossible within the limits of this paper to refer more fully to individual cases. One case I mention because I am quite unable to explain the phenomena present, even on the hypothesis of an acidosis, unless some specific toxic factor such as might give rise to an acute hæmolysis were present, possibly a specific acid. The child, M. C., aged 1 year, 11 months, included in my cases of recovering cases was a very ordinary typical case of rickets. From time to time she had run an intermittent temperature—on four separate occasions up to 103° or 104°—without general constitutional disturbance. The temperature was attributed to teething, which had been much delayed. No other abnormality was noted. After five months in hospital she became suddenly ill one afternoon, refused food and vomited. Her temperature ran up to 105°. She looked very ill and miserable, but nothing definite could be found wrong with her. The bowels had been opened freely that day, chest condition normal. Within 12 hours she became semi-comatose, high-pitched rhonchi developed in the chest, with rapid respiration and considerable dyspnœa. It was quite impossible to give food. There was no improvement under salines and stimulants. A few hours later I recognised acetone in the breath, but there was a very small quantity only present in the urine (catheter specimen). Typical post-mortem staining appeared in the skin, about the same time and at least six hours before the death of the child took place. There was a moderate amount of collapse, but I believe death was from asphyxia. I had never previously seen skin hæmorrhages of so marked and severe a character, except in very acute bacterial infections or in septicæmia. On post-mortem examination no cause of death was found; all organs appeared normal; the lungs showed no signs either of bronchitis or of broncho-pneumonia; the spleen was quite hard, normal colour, doubtfully enlarged. Blood cultures taken from the left ventricle of the heart were reported by Prof. J. M. Beattie (Liverpool City Laboratory) negative.

The only clinical condition which I have been able to find in any text-book at all resembling the conditions in this case is that described by Prof. Still, under the name of recurrent pyrexia. The cause is said to be an unidentified toxin, in Still's opinion, of intestinal origin. The hæmolysis in this case is interesting, in view of the blood picture in rickets. A secondary anæmia is usually described. Pritchard believes that the epiphysial enlargement is the result of the reaction of the blood-forming elements of the bone marrow to an active condition involving blood destruction.

It is obvious that new light thrown upon the metabolism in rickets is only valuable in so far as it may be utilised in the prophylaxis and treatment of the disease. In the present state of our knowledge the provision of easily digested and assimilable fat containing adequate vitamins (e.g., cod-liver oil) will remain popular. My own belief is that cod-liver oil is definitely serviceable when the diet has previously been deficient in fat, more especially if excess feeding is carefully guarded against, by a careful regulation of the diet. Schloss has recently pointed out that there is no special efficacy in cod-liver oil alone, but good results are obtained by giving it in conjunction with calcium salts, presumably by a more efficient absorption of the latter.[27] This should apply to its addition

to a diet of cow's milk (containing an excess of calcium salts) the usual empiric treatment in this country.

The presence of an acidosis in rickets calls for careful prophylactic measures, along lines likely to prevent such a condition, whether it be the determining factor in the disease or otherwise. Treatment on these lines has been excellently outlined by Pritchard.[14] It includes the correction of faults of dietary, more particularly overfeeding, provision for adequate exercise, surface stimulation by baths and fresh air, relief of respiratory embarrassment from whatever cause, and the avoidance of infections—catarrhal or otherwise—in so far as this can be arranged. Remedial measures must include the treatment of the underlying condition—that is, the treatment of an acidosis from whatever cause it has arisen.

In conclusion I have to thank Prof. Ramsden, Dr. Ruby McBirnie, the staff, medical and nursing, of the Liverpool Day Nurseries and of the Leasowe Hospital, and Dr. Phœbe Bigland for help at various stages of my work.

References.

1. Journal of Physiology, 1918, liii., p. xi.; THE LANCET, 1919, i., p. 407; Proc. Royal Society of Medicine, Feb. 27th, 1920.
2. Journ. Biol. Chem., 1920, vol. xxi., xli., p. 3.
3. Findlay, Leonard: B.M.J., 1908, ii., p. 13; B.M.J., 1918, ii., p. 625.
4. Renton, M., and Robertson, M.: Journ. of Path. and Bact., 1916, xxi., 1.
5. B.M.J., 1920, ii., p. 157.
6. Hopkins, F. Gowland: B.M.J., 1920, ii., p. 147; Hess, A. F., and Unger, J.: Journ. of American Med. Ass., 1920, p. 217.
7. Ramsden, W.: Journ. Soc. Chem. Industry, 1918, vol. xxxvii., p. 53; Osborne and Mendel, Journ. Biol. Chem., 1915, xx., p. 379; McCollum, W. G., and Davis: Proc. Soc. Exp. Biol. Med., 1914, xi., p. 101.
8. Drummond, J. C.: Bio-Chem. Journ., May, 1919, xiii., p. 86.
9. Hess, A. F., and Unger, J.: Journ. of American Med. Ass., lxx., p. 900.
10. Rickets Report of the Medical Research Committee. Ferguson, M. Pp. 72, 561, &c.
11. Walshe, F. M. R.: Q. Journ. of Med., 1918, p. 321.
12. Wright, A. E.: THE LANCET, 1900, ii., p. 565.
13. Hess, A. F., and Killian: Proc. Soc. of Exp. Biol. Med., 1918.
14. The Infant Nutrition and Management: Glasgow, 1918, pp. 227–240; B.M.J., 1919, Nov. 15th, p. 627.
15. B.M.J., 1921, i., p. 542.
16. THE LANCET, 1920, i., p. 188.
17. Cautley, E.: From Garrod, Batten, and Thursfield: Diseases of Children, p. 111.
18. Schwarz, Jahrb. Kinderheilk., 1910, lxxii., p. 549; quoted by Wolf, J.: Journ. of Biol. Chem., 1911–12, x., p. 475.
19. Journ. Biol. Chem., 1916, xxvii., 127.
20. Paton, D. Noel, Findlay, L., and Burns: Journ. of Physiology, 1915, xlix., xvii.
21. Journ. Biol. Chem., 1918, xxxiv., pp. 66–75.
22. Van Noorden, vol. iii., 861, 1272; McCallum, W. G., and Voegtlin, C.: Journ. of Exp. Med., 1909, xi., p. 118.
23. Howland, J., and Marriott, McKim: Q. Journ. Med., July, 1918.
24. Hutchison, H. S.: Q. Journ. Med., April, 1920.
25. Steinitz: Quoted by Van Noorden, iii., p. 861. Langstein and Meyer: Jahrb. Kind., 1906, xiii., p. 30.
26. Proc. Royal Soc. of Med. (Anæsthetics), 1912, p. 60.
27. Jahrb. für Kind., 1915, lxxxii., No. 6, pp. 435–510.

WORTHING CHILDREN'S CARE SOCIETY.—Dr. R. H. Wilshaw, M.O.H. of Worthing, addressed this society at its annual meeting on Oct. 17th. He said that 12 years ago, when the society was first formed, the infantile mortality-rate of Worthing was over 100. In five or six years the rate was halved; in 1920 the figure was down to the record level of 39. These figures provided a sufficient answer to those who said there was no need for a Children's Care Society. Dr. Wilshaw attributed the fall in infantile mortality largely to the influence and work of this society and of the Infant Welfare Centre, and emphasised that the object of the two organisations was to keep healthy babies healthy, and not to cure sick ones.

SOUTH-WESTERN OPHTHALMOLOGICAL SOCIETY.—A meeting of this Society was held on Oct. 24th at the Eye Hospital, Bristol. After an exhibition of cases of interest Mr. Ransom Pickard opened a discussion on the Development of Normal and Abnormal Disc Cups, drawing particular attention to the need for systematic record of the dimensions of the disc cup; it should be available for future reference and comparison in the event of subsequent morbid developments within the eye. He brought forward a method for the charting of these data. After the meeting the members dined together at the Grand Hotel. An invitation to meet the Midland Ophthalmological Society next April in Birmingham was received from its President, Mr. Bernard Cridland, and accepted.

CARDIAC MASSAGE.*

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THE principles underlying massage of the heart are very much the same for whatever condition it is applied. I propose first to state these general principles, and later to discuss the employment of massage in chloroform syncope, a form of syncope with which I am most familiar from an experimental point of view, and a form which is, I think, of more interest to the surgeon than any other. The conclusions at which I have arrived are mainly the outcome of a recent investigation, and whilst I have some things to say which are new, a good deal is not new, but is in agreement with and serves to confirm the opinion of others.

J. A. Gunn[1] has recently published a paper in which he lays down certain physiological principles for guidance in performing massage, and whilst I am in accord with much that he has written, his paper requires expansion, for he deals with one form of chloroform syncope only—viz., that from overdosage—whereas primary cardiac syncope is the condition which calls most urgently for the application of this method of resuscitation.

I think that the small number of cases in which cardiac massage has been practised with a successful result are sufficiently well known to excuse further comment upon them, but I am sure that the large number of the unsuccessful attempts is unappreciated; they are, in fact, almost sufficiently numerous to bring cardiac massage into disrepute. This is not as it should be: I am therefore showing how consistently successful results are obtained in animals, and giving my reasons for the belief that similar results can be obtained in man. The sole function of cardiac massage, as I maintain in common with others, is to create an artificial circulation; to perfuse the lungs, and to supply the heart and central nervous tissues with oxygenated blood in order to preserve their function. This view has been brought forcibly home to me in my special work.

"Massage" a Misnomer—Massage and Mechanical Stimulus.

The term "massage" is a misnomer; it is not massage of the muscular tissue of the heart which is required, but a rhythmical compression of the heart efficient in expelling with fair force the contents of both ventricles; the right ventricle must be compressed as well as the left, and I have not found my experimental results to be consistently satisfactory unless this point receives careful attention. Obviously a good supply of oxygenated blood to the left ventricle can only be obtained by emptying the right. In the human heart the hand must therefore have ready access to the right ventricle, and this is one of the points in surgical technique which tend to turn the scale between success and failure.

I may digress for a moment to a point of more academic interest. Gunn[1] maintains that massage also acts as a mechanical stimulus to the heart beat; it is, however, difficult to see how this can be, or to agree that sufficient reason has been given in support of this view. Personally I believe massage is deleterious to the heart beat and I think Gunn and Martin's[5] own experiments may be interpreted as bearing out this point of view; the heart beat is most certainly not initiated in cases of ventricular fibrillation (see Fig. 2) by mechanical stimulus, and I think this theory should be entirely disregarded in considering practical methods.

Surgical Technique.

The technique of obtaining proper access to the heart and compressing it is evidently of great importance; direct access to the heart appears to me to be essential. In a number of recorded cases of the

* A paper read at a meeting of the Section of Surgery of the Royal Society of Medicine on July 1st, 1921.

practice of massage the heart has been exposed by resecting the costal cartilages and opening the pericardium, but this method has been attended with a single success only. It is a somewhat severe operation, and the delay incurred is a serious disadvantage. The subdiaphragmatic mode of approach has nearly all the recorded successes to its credit, but I believe likewise a very large number of failures. It can rarely be entirely satisfactory. Bost and Neve[1] say that compression of the heart in this way is possible though difficult in the child, but in the adult it can rarely be effected, as only the cardiac apex can be reached, and this tends to slip upwards. Further they say that it is possible to obtain direct access to the heart inside the pericardium by an incision into the base of it from below the diaphragm; the left lobe of the liver and the stomach are, however, liable to get in the way in this operation; there is a risk of injuring the musculo-phrenic artery, and considerable difficulty in inserting sutures in the diaphragm and finally closing the incision. Bost and Neve[1] have therefore devised another method of obtaining direct access, which is briefly as follows: An abdominal incision is made, and through this the attachments of the diaphragm to the left costal margin are cut for 2 inches. The right hand is inserted into the left pleural cavity and the heart grasped outside the pericardium. During massage the parts are pressed around the right wrist to prevent air entering the pleural cavity. This method appears to me to satisfy most nearly the required conditions. Bost and Neve[1] obtained a success with it in a case in which the subdiaphragmatic method had previously failed, and Coleman[2] has recently narrated a somewhat similar experience.

The Performance of Artificial Respiration.

Success as a result of cardiac massage is almost out of the question without artificial respiration, but there is abundant evidence that its performance has frequently been neglected. In man, judging by clinical records, as in cats, there is frequently a strong tendency to persistence of the respirations after primary cardiac failure, and no doubt cardiac massage, if performed soon enough, will assist to maintain them. Such efforts can, however, only be fitful and quite inefficient for the purpose in view as a general rule, although it would appear that recovery by massage has occurred in a few instances without artificial respiratory assistance. Artificial respiration by Sylvester's method is possibly sufficient when there is no opening into the pleural cavity, if it can be done without interference with the proper performance of massage. In an operation for direct access to the heart perflation of the lungs is without question the right method to adopt; it obviates the risk of the production of pneumothorax and provides for full inflation of the lungs when the hand is in the left pleural cavity. Intubation of the larynx can easily be performed on an individual in the flaccid condition following cardiac syncope, when the initial asphyxial spasm, if any, has passed off, and the lungs can be readily blown up through the tube by the lung power of another person. Perflation of the lungs by means of the apparatus employed for the intratracheal method of administering an anæsthetic should likewise be effective; a steady stream of oxygen passed direct from a cylinder through an intratracheal tube would serve exceedingly well, provided, of course, that the force of the blast is carefully controlled. A pair of bellows constitutes a simple apparatus for performing intermittent perflation. Even mouth-to-mouth perflation may be practised in an emergency, but one or other method must be employed in an efficient manner in conjunction with intrathoracic massage if cardiac massage is to be a practical success.

I agree with Gunn as to the importance of a proper mechanical device for the purpose of artificial respiration; there used to be an apparatus of this kind called a lung motor on the market, but I have no personal experience of its employment. It has been urged that the rigidity of the human thoracic cage tells against intermittent perflation, but the pliability of the diaphragm allows sufficient room for pulmonary expansion. W. E. Fisher[3] has practised with success a method of combined massage and artificial respiration; by a series of thrusts with the fingers under the diaphragm he at the same time compressed the heart and expelled air from the thorax. Such a method as this can only be regarded as tentative, and not likely to have a large measure of success; I am convinced that both surgeon and anæsthetist must be absolutely thorough in their methods if they are to justify the performance of massage.†

The Method of Applying Cardiac Compression.

I have tested the effect of varying the rate of compression, and do not myself regard this as a matter of much importance. It is necessary to maintain sufficient circulation pressure in the arteries, so I do not think the rate should be much less than that of the natural beat. The rate of compression bears no relation to that of the spontaneous beat on recovery. Gunn and Martin[5] have found that in the overdosed heart a spontaneous beat develops more readily after a pause in the massage, and they recommend that after a time massage should be intermitted by short pauses. I have independently found that recovery after primary cardiac failure is influenced similarly, a matter to which I will refer again later. The interruption of massage is evidently a point of considerable importance.

Limit of Interval between Occurrence of Syncope and Commencement of Massage.—Posture.

This point appears to be fairly well decided. The limit is not conditioned by any cardiac consideration, at least not mainly, for the heart possesses remarkable powers of recuperation after prolonged periods of suspended circulation. The limit is a quite narrow one and is set by the length of time that the nerve centres can stand deprivation of blood; if this interval is too long, severe nervous symptoms supervene on restoration of the circulation, such as tetany, rigidity, screaming, incontinence of urine, and signs of severe cerebral irritation, and these generally terminate fatally. Evidently A. E. Russell's[11] limit of five minutes is a safe one, and is now generally accepted, but the case need not be regarded as absolutely hopeless after a longer interval: in Mollison's[9] case it was 13 minutes, but the patient only recovered after prolonged and serious cerebral symptoms had occurred. This time limit is within that in which intravascular clotting can occur, so that clotting requires no special consideration.

Partial inversion is no doubt of benefit in assisting the cerebral circulation, and the filling of the heart chambers. There is no experimental evidence to show that it assists recovery in any other way.

Chloroform Syncope.

The foregoing principles have a general application to cardiac massage under any circumstances. In chloroform narcosis two principal forms of syncope require some separate consideration.

1. *Syncope from Overdosage.*—In this form of syncope both the heart and respiratory centre are affected by the excess of chloroform, but the respiration fails first, and the heart subsequently, partly from the effect of the chloroform and partly from lack of oxygen. The heart's action is never totally suppressed by an overdose and it continues to beat, faintly it is true, but yet without doubt sufficiently to maintain a measure of pulmonary and coronary circulation; artificial respiration can thus restore the heart beat, first by supplying much needed oxygen, and secondly by causing exhalation of the excess of chloroform. It is my personal opinion that recovery can always be effected by artificial respiration alone when the latter is promptly applied, as probably it always is, but I recognise that if it be neglected the heart becomes totally asphyxiated and incapacitated and may not then be amenable to this treatment. In such an exceptional circumstance cardiac massage would be called

† I presume the anæsthetist devotes his attention to the pulmonary ventilation.

for. The adequacy of massage to restore the beat of the overdosed heart has been fully proved; my personal experience in experiments on cats has been a rapid success in all cases, even in hearts artificially overdosed to the complete extinction of the ventricular beat. The heart recovers from an overdose in a characteristic fashion. The beat is at first very feeble and may require further massage to improve it. Thenceforth improvement in both beat and blood pressure is gradual and progressive, consistent with the view that the heart gains in strength as the blood excretes its chloroform (Fig. 1).

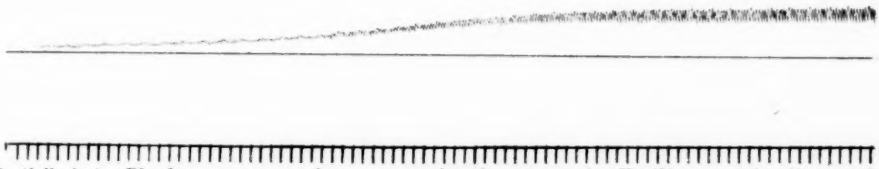

FIG. 1 (full size).—Blood-pressure curve from an experiment upon a cat. Hurtlé manometer, time marked in seconds. The heart had been overdosed with chloroform to extinction of the beat. The heart beat was restored by massage and artificial respiration, and the tracing shows the characteristic gradual improvement of beat and blood pressure which occurs after an overdose.

Gunn[4] recommends washing adrenalin into the heart through the jugular vein before commencing massage, but it cannot enter the coronary circulation unless the heart is beating, when it is not wanted, or until the commencement of massage, which succeeds without it. In my own experimental experience adrenalin has no beneficial effect upon a heart which has been overdosed with chloroform to the extinction of its function, so that it does not appear to me that the risky combination of adrenalin and chloroform is justified by any theoretical consideration. If the blood pressure is low following recovery, then pituitrin should be injected, not adrenalin, for the latter is dangerous to the heart which has thrown off its excess of chloroform. I can confirm Gunn and Martin's observation that although the action of the vaso-constrictor agent be temporary, the effect in such circumstances tends to be a permanent rise of pressure.

2. *Primary Cardiac Syncope.*—In this form of syncope the respiratory centre is not depressed by the chloroform, and the respirations continue for a short period after the stoppage of the heart, but the respirations fail likewise shortly afterwards owing to cessation of the circulation. Neither is the heart depressed by the chloroform; it fails quite suddenly from the onset of ventricular fibrillation in the course of full activity. Sometimes the respirations are exaggerated immediately before they finally cease, sometimes there is a spasm of the whole body; sudden pallor and extreme dilatation of the pupils also help to identify this form of syncope. Ventricular fibrillation has generally been regarded as necessarily fatal, but this is by no means the case; that recovery may occur in man is proved by the electrocardiographic record obtained by Robinson and Bredeck,[10] and there is indeed in my opinion clinical evidence that spontaneous recovery is more common in man than a fatal termination. Three cases of serious syncope noted by Seymour Jones[6] following the injection of adrenalin under chloroform were certainly due to ventricular fibrillation, yet they all recovered without treatment; a number of reports of spontaneous recovery from primary cardiac syncope in chloroform anæsthesia are found in the pages of the Report of the Anæsthetic Committee of the British Medical Association, and in these instances there can be little doubt fibrillation had occurred.

I am laying stress upon this tendency towards spontaneous recovery from fibrillation in man, because it is correlated with success in the practice of cardiac massage, massage being merely a means of saving the heart from asphyxia, and affording it a prolonged opportunity of exerting its natural tendency to recover spontaneously. In dogs there is little of this tendency, and attempts at resuscitation by massage generally terminate in failure. In cats, on the other hand, there is a conspicuous tendency towards spontaneous recovery, and in these animals I have found cardiac massage consistently successful. I therefore class man in the same category as the cat, in respect of the successful issue of massage. In cats spontaneous recovery always occurs whilst the heart is still vigorous and the fibrillary movements active—that is, within the first one and a quarter minutes from the moment of syncope; it cannot occur later when the heart has become asphyxiated. On perfusing the heart with oxygenated blood by massage with artificial respiration the active fibrillation is sustained until sooner or later, provided massage is continued sufficiently long, the fibrillary movements are replaced by the normal sequential beat.‡ The practical lesson is obvious: not more than two minutes should be allowed for the chance of spontaneous recovery following primary cardiac syncope in man and thereafter cardiac massage should be proceeded with without hesitation. If recovery has not been effected after five minutes of continuous massage, this should be intermitted by a pause of about 15 seconds, later extended to 45 seconds, and this procedure may be found successful either during the pause or on resumption of massage. A pause appears to rest the heart from the depressing influence of manipulation, for it results in increased fibrillary activity. An illustration of this event is shown in Fig. 2;

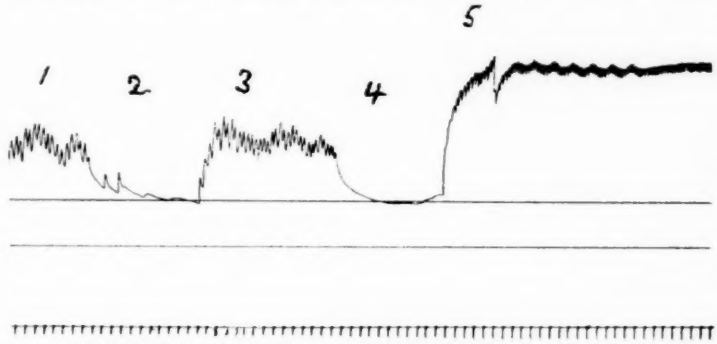

FIG. 2 (full size).—Blood-pressure curve from an experiment on a cat. Hurtlé manometer. Time marked in seconds. Resuscitation of the fibrillating ventricles by cardiac massage combined with artificial respiration. The tracing shows two periods of massage, 1 and 3, and two pauses, 2 and 4. The heart recovers during a pause. The recovery from fibrillation, 5, is characteristically rapid, and contrasts vividly with the gradual recovery after overdose.

‡ Recovery from fibrillation is not merely a recovery from inactivity, as it is in the case of overdosage. The normal beat is not superposed on fibrillation, and the latter must cease before recovery can take place; there is a momentary phase of inactivity interposed.

incidentally such an experiment shows how mechanical stimulus plays no part in the resuscitation of the normal beat. The recovery from fibrillation is sudden and characteristic; the first beats are sufficiently powerful to cause the blood pressure to mount up rapidly (Fig. 2), for the heart has not been depressed by an excess of chloroform.§

Sometimes a temporary cessation of fibrillation occurs within the first few minutes of onset, but the heart cannot beat because it is asphyxiated, and fibrillation is soon resumed. If such a period happens to be hit upon when commencing massage, recovery is easy and rapid, but the beats are first feeble and gain strength slowly, for it is a recovery from simple asphyxia. Apart from this happy chance the length of interval between syncope and the commencement of massage is not of great importance in relation to the rapidity of cardiac recovery, at least up to a limit of 15 minutes. The duration of massage is fortuitous; it varied from one up to 48 minutes in a series of 29 cats upon which I experimented. The following table shows my results *in extenso*. Every case had a successful issue, so that the absolute efficiency of massage for fibrillation in cats is remarkable.

Results of Massage for Fibrillation in Cats.

(A) Shows interval in minutes from moment of syncope to commencement of massage.
(B) Duration of massage before ventricular beat returned.

(A)	(B)	(A)	(B)
2 ..	19 min. 30 sec.; 20 sec.*; 1 min. 10 sec.*; 1 min.*; 9 min. 35 sec.; 1 min.*; 4 min.; 12 min. 30 sec.	5 ..	30 sec.*
		7 ..	48 min.
		8 ..	22 min. 25 sec.; 6 min. 10 sec.
		9 ..	23 min.
		10 ..	3 min. 15 sec.; 5 min. 40 sec.
2½ ..	2 min.; 4 min. 30 sec.; 9 min.	11 ..	4 min.
3 ..	16 min.; 5 min. 30 sec.; 20 sec.*; 2 min. 50 sec.	12 ..	8 min.
		13 ..	4 min. 10 sec.; 7 min.
		15 ..	24 min. 30 sec.
4 ..	3 min.		

* In those experiments marked by asterisks fibrillation was in abeyance when massage was commenced.

The blood pressure on recovery from fibrillation is nearly always satisfactory; should it be unsatisfactory an injection of pituitrin will improve it very much.

Use of Drugs.

McWilliam[8] tested the action of adrenalin and a number of other drugs upon the fibrillating ventricles; he used them in conjunction with massage and obtained successful results. I have repeated most of these experiments, but in my experience the results of massage alone are equally good, and I have so far been unable to convince myself that any of the drugs are of real service. Further research is desirable upon the subject, but for the present drugs are better left alone; the drug that will stop fibrillation is yet to be found.

It is for the treatment of primary cardiac syncope from ventricular fibrillation that cardiac massage finds its most urgent application. If a patient fails to recover spontaneously from fibrillation within two minutes massage becomes imperative, for there is no other remedy. I think I may claim to have demonstrated the effectiveness of this remedy; the treatment of ventricular fibrillation by this method in cats has been shown to be consistently successful, and I believe similar results can be obtained in man. It must, however, be admitted that the conditions are not so favourable in man. In animal experiments the chest is laid open and the heart made thoroughly accessible; it can be compressed by the fingers without undue fatigue, the efficiency of massage can be judged by inspecting the colour of the left auricle, the lungs are seen expanding and the efficiency of the artificial respiration can be gauged, and the nature of the fibrillary movements can be inspected. In man there must be some difficulty in getting at the heart and efficiently embracing the ventricles in the grasp, and fatigue of the operator's hand is an element which is not negligible in a prolonged case. The proposition in man seems to me a somewhat different one and occasional failures must be expected, but with a proper knowledge of the principles involved and their careful application very much better results may, I am persuaded, be obtained in cases of massage than has hitherto been the case.

§ Fibrillation does not occur in full chloroform anæsthesia.

Rules for Performance of Cardiac Massage in Chloroform Syncope.

(*a*) In syncope from overdosage. Partial inversion and immediate artificial respiration by Sylvester's method. If recovery does not occur within three minutes, artificial respiration alone is not likely to avail. Proceed after three minutes to perform intrathoracic massage with perflation of the lungs. (*b*) In syncope from primary cardiac syncope. Partial inversion for two minutes (with artificial respiration if the diagnosis is not quite certain). If spontaneous recovery does not occur within two minutes, proceed at once to intrathoracic massage, with perflation of the lungs. (*c*) In the interest of the nerve centres cardiac massage should be commenced within five minutes of syncope. (*d*) Success depends upon proper access to, and the efficient compression of both ventricles, and an efficient system of artificial respiration. (*e*) If continued rhythmic compression is not successful in five minutes, it should be intermitted for periods of up to 45 seconds' duration. (*f*) Massage should be continued, if necessary, up to one hour's duration before abandoning the case. (*g*) It is advisable to rely throughout on massage alone and discard the use of drugs. (*h*) If the circulation is feeble after recovery, an intravenous injection of pituitrin is desirable.

References.—1. Bost, T. C., and Neve, A.: THE LANCET, 1918, ii., 552. 2. Coleman, R. B.: Brit. Med. Jour., 1921, i., 47. 3. Fisher, W. E.: Brit. Med. Jour., 1920, ii., 698. 4. Gunn, J. A.: Brit. Med. Jour., 1921, i., 9. 5. Gunn, J. A., and Martin, P. A.: Jour. Phar. and Exp. Therap., 1915, vii., 31. 6. Jones, B. S.: Brit. Med. Jour., 1912, i., 421. 7. Levy, A. G.: Heart, 1920, vii., 175. 8. McWilliam, J.: Proc. Roy. Soc. Lond., 1919, xc., 302. 9. Mollison, W. M.: Proc. Roy. Soc. Med., 1916–17, x. (Sect. Anæsth.), 1. 10. Robinson, G. C., and Bredeck, J. F.: Arch. Int. Med., 1917, xx., p. 725. 11. Russell, A. E.: Clin. Jour., xxxiv., 321, 343, 360, 377.

A NOTE ON THE INVESTIGATION OF GASTRIC FUNCTION BEFORE AND AFTER GASTRO-JEJUNOSTOMY.

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IN obtaining these notes on the effects of gastro-jejunostomy on gastric secretion use has been made of the fractional test-meal as described by J. A. Ryle[1] and J. H. Ryffel,[2] the pioneer being Rehfuss.[3] All types of case have been examined—e.g., gastric and duodenal ulcers, carcinoma of the stomach—where a gastro-enterostomy has been performed, alone or together with a partial gastrectomy. The notes may give an indication as to what one anticipates will occur in a large series of each type of case. Such a complete paper will be published ultimately.

Ryffel has described the relative merits of the two methods of test-meal examination of the stomach, and Ryle has published his facts on the fractional test-meal for the diagnosis of gastric and duodenal lesions, and also his series of normal curves. Use was therefore made of the latter type of meal to arrive at a diagnosis before operation, together with a chemical examination of the fæces and also a barium meal examination of the stomach; notes were made about the lesion found at operation and of what was done; and after six months the patient was re-examined by X rays and by test-meal.

Four types of curves are shown in this paper: (1) Prepyloric gastric ulcers; (2) pyloric ulcers; (3) duodenal ulcers; (4) carcinoma of the stomach. The first curve, for comparison, is one of a so-called normal type (Fig. 1).

Group 1: Prepyloric Ulcers.

B. B., female, aged 46 years, had complained for two years of frequent attacks of indigestion; pain of a gnawing character usually came on about 35 minutes after taking

[1] THE LANCET, 1920, ii., p. 490. [2] Ibid., 1921, i., p. 586.
[3] Amer. Journal of Science, 1914, Ch. 147, p. 848.

food, lasting for about five hours; it was not alleviated by taking food or medicine. She never had had hæmatemesis, and only on rare occasions did she vomit. In the last three months she had lost a considerable amount of weight; this loss she ascribed to her inability to take food for fear of the pain it would cause her. Physical examination showed the patient to be thin and wasted, but no abnormality was detected on palpation. Test-meal showed that her rise of acid was slow and that her rate of emptying was also slow. This pointed to gastroptosis, but as the fæces contained altered blood, as shown by an acid hæmatin spectrum and a positive guaiac reaction, it was decided that she might have a prepyloric ulcer with adhesions.

X ray examination of the stomach—carried out with all other X ray examinations recorded in these notes by Mr. J. Magnus Redding, surgical radiographer to Guy's Hospital, and by whom all X ray examinations published in these notes were performed—resulted in the following report: "Stomach deeply ptosed and is hypotonic, and contains a good deal of fluid. The motility is poor. There is a projection from the posterior surface of the stomach near the lesser curvature in the prepyloric position. ? an ulcer. The duodenum shows considerable deformity, suggestive of adhesions." Note that the diagnoses arrived at by test-meal and X rays are practically identical.

An operation was performed a few days later and a prepyloric gastric ulcer on the lesser curvature of the stomach was found. The greater omentum was bound down to the pelvis, a fact due to a previous operation (hysterectomy) performed; and so this binding down of the stomach via the greater omentum caused a certain amount of gastroptosis. Posterior gastro-jejunostomy was performed; the patient made an uneventful recovery.

Six months after her discharge from hospital I saw patient again and carried out another test-meal examination. She stated that she had had no recurrence of pain, had put on weight, and felt much better in every way. Test-meal showed that at no time did she get free hydrochloric acid into her stomach, but that the total acidity in ½ hour reached the maximum and was as high as the total acidity before operation, but in this case she had bile in her resting juice, and a great quantity of bile was poured into the stomach during the period of examination. It was impossible to extract fluid after 1½ hours (stomach empty).

From comparison of the test-meal before and after operation it seemed that: (1) Bile entered the stomach in large quantities; (2) the stomach emptied rapidly; (3) no free acid was obtained ? due to neutralisation from the bile; (4) the total acidity reached the same level as before operation, but the free hydrochloric acid was diminished. These four facts have been found to occur in every case of prepyloric ulcer examined up to the present time.

Group 2: Pyloric Ulcers (with or without Stenosis).

As will be seen from the accompanying curves, before and after gastro-jejunostomy in this type, the total acidity reached in both curves is about the same level, although the time relation may alter and also that the same rule applies to the free hydrochloric acid. The stomach is emptying usually more rapidly, and bile is entering the stomach.

T. G., male, aged 27 years, gave a three years' history of intense pain coming on very quickly after meals, and at first persisting for one hour; but this period later extended so much that in the end the patient had scarcely any interval between the pain of one meal and the pain coming on from the second. In spite of medicinal treatment and dieting patient's symptoms steadily got worse, and in the end became so severe that he was unable to leave his bed. Test-meal examination showed delayed emptying of the stomach as shown by the persistence of starch and sugar; there was also hyperchlorhydria and blood was present. Pyloric ulcer with stenosis was diagnosed. Fæces contained altered blood. X ray examination showed no abnormality.

At operation a large pyloric ulcer stuck down to the pancreas was found, causing pyloric stenosis. In addition there were numerous adhesions to the liver and gall-bladder. A posterior gastro-jejunostomy was performed. Six months after operation patient looked a new man, and felt strong and well. He had put on almost eight pounds in weight, could take any type of food, although he restricted himself somewhat on previous advice, and he had had no recurrence of symptoms.

Group 3: Duodenal Ulcers.

T. C., male, aged 15 years, has had attacks of indigestion for some years. In the last three months the attacks of pain which came on about 1½ hours after taking a meal had become steadily worse. He was awakened at nights with "hunger pain." In the early stages the taking of food had relieved the pain a little, but in the later stages this had had no effect. He had much flatulence. Physical examination showed patient tender in the epigastrium rather to the right of the mid-line; otherwise no abnormality. Test-meal showed a high resting juice containing bile; during the meal the free acid and total acidity rose to a much higher level than in any curve mentioned before. The stomach was emptying rapidly. Fæces contained altered blood. X ray examination showed presence of an irregularity near the pylorus on the duodenal side.

At operation a duodenal ulcer ½ in. from the pyloric ring was found. A posterior gastro-jejunostomy was performed. Six months later patient was very much better, had put on weight, and had had no recurrence of pain. Test-meal showed bile to be present throughout the whole meal—the resting juice was still high in acidity, the maximum of the curve for total acidity was as high as before, whilst the free acid almost reached the same level. The free acid in the resting juice is diminished in quantity.

Group 4: Carcinoma of the Stomach.

(A) *Partial Gastrectomy and Gastro-jejunostomy.*—Mary W., aged 39 years, had been losing weight steadily for six months, and had begun to get pain on taking her meals. She vomited occasionally, and was now able to take sloppy foods only. Examination showed the presence of a hard movable mass in the epigastrium about the size of a florin. Test-meal showed a low free hydrochloric acid and a moderate curve for total acidity. Blood was also present as coffee grounds. This was taken as an indication of carcinoma. X rays: Stomach showed profound ptosis, the greater curvature lying nearly at the upper border of the symphysis pubis. Motility poor and meal leaving slowly. Pyloric canal elongated with an irregularity. Sixth hour: Some of meal still in stomach. Thirtieth hour: Still some meal in stomach. Fæces, altered blood present.

Operation.—A movable pyloric growth (carcinoma microscopically) discovered. Some enlarged glands along the curvatures of the stomach. Partial gastrectomy, and gastro-jejunostomy (Polya-Mayo method). Six months later patient could eat a hearty meal, and had no pain. She had put on weight—about 7 pounds—and had no vomiting. Test-meal showed the absolute absence of free hydrochloric acid and a very low total acidity curve. The remains of the stomach were emptying quickly.

In the other cases of gastrectomy I have collected there was no free hydrochloric acid in either curve, before or after operation.

B. *Carcinoma Ventriculi: Gastro-jejunostomy only.*—A. C., male, aged 51 years, had been losing weight for about a year. Pain in the epigastrium, present at all times, was getting steadily worse, and it was accompanied by vomiting. Physical examination revealed nothing, but it was noticed that patient was extremely wasted. Test-meal showed great delay in the emptying of the stomach, blood was present, and the free hydrochloric acid was low and late in appearing. Diagnosis was pyloric stenosis, probably due to growth. X rays showed the stomach to be of large capacity, the lower pole being 2 inches below the iliac crest. No irregularity along either curvature, but the barium was leaving slowly. After five hours stomach was a quarter full; no tenderness.

At operation a large pyloric carcinoma was found, and there were secondary deposits in the liver. A posterior gastro-jejunostomy was performed. Subsequent examination showed that patient had been relieved of his pain and that his stomach was emptying in about normal time. A certain amount of bile was present and a positive guaiac was obtained in the stomach contents. The free hydrochloric acid was not present, and the total acidity was lower than in the first meal before operation.

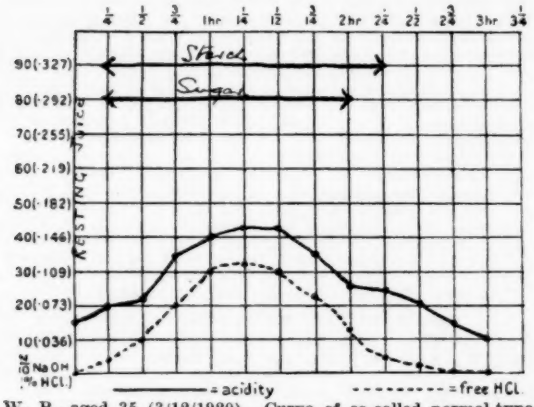
I have also had the good fortune to have two cases of prepyloric ulcer—one treated by excision of the ulcer only, and the other where the ulcer was cauterised and a gastro-jejunostomy performed, and in both cases have the results followed into the prepyloric group. I have also had the better fortune to have the pre- and post-operative results of three cases of gastro-jejunal ulcer following a previous gastro-jejunostomy. In each case after excision of the gastro-jejunal ulcer, the previous curve being of the duodenal ulcer type, the second curve has followed into the same group—i.e., the duodenal ulcer grouping.

Conclusion.

The indications at present arrived at seem to show that—

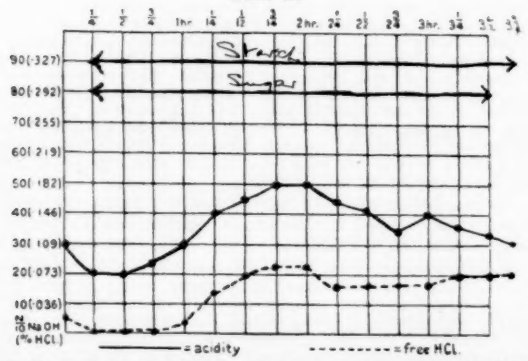
(*a*) Ulcers can be grouped under three headings: (1) Prepyloric, including cardiac ulcers; (2) pyloric

FIG. 1.



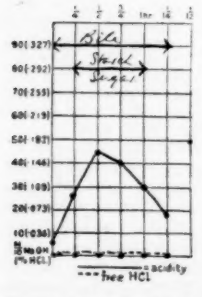
W. B., aged 35 (3/12/1920). Curve of so-called normal type. Note that the rise of free hydrochloric acid and the total acidity does not reach any great level, and that the stomach is emptying in normal time (2½–2¾ hours) as indicated by the sugar and starch estimation. Any other constituent present—e.g., bile or blood—will be found charted on the curves.

FIG. 2.



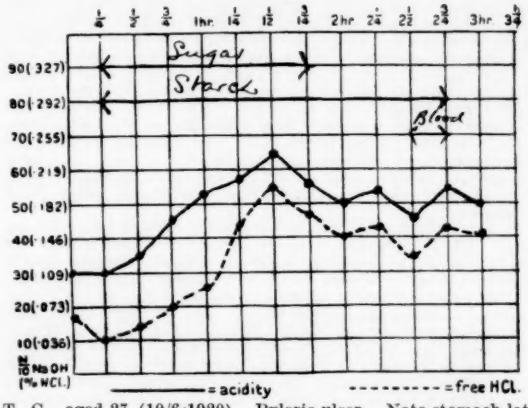
B. B., aged 46 (3/11/1920). Before operation. Note the delay in emptying of the stomach and slow rise of acid.

FIG. 3.



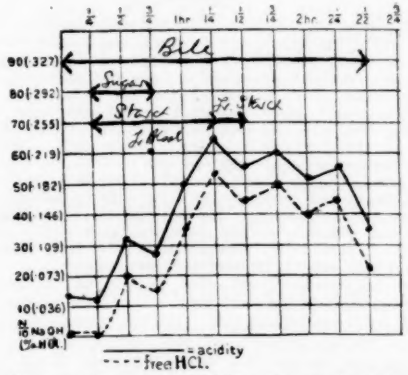
Same patient as Fig. 2 (11/5/1921) after gastro-jejunostomy. Note the rapid rate of emptying of the stomach and the presence of bile; no free hydrochloric acid. Total acidity reaches 46 (cf. before operation 50).

FIG. 4.



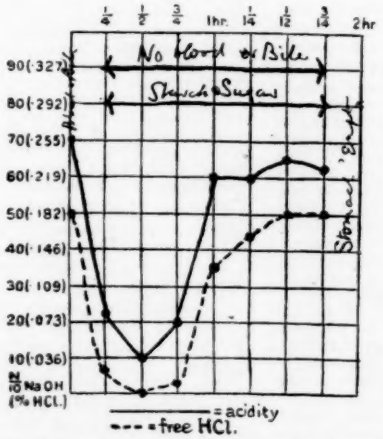
T. G., aged 27 (10/6/1920). Pyloric ulcer. Note stomach late in emptying; hyperchlorhydria; presence of blood.

FIG. 5.



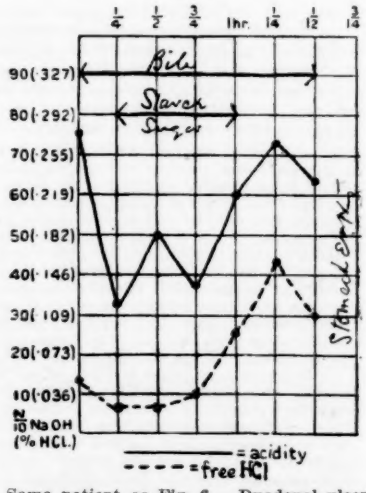
Same patient as Fig. 4 (14/1/1921) after gastro-jejunostomy. Note stomach emptying rapidly; bile present; maximum total acidity and maximum free hydrochloric acid reach same level before and after gastro-jejunostomy.

FIG. 6.



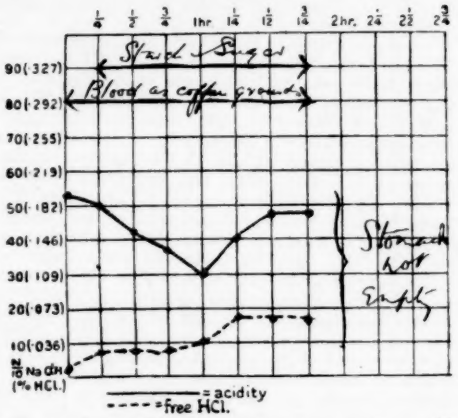
T. C., aged 45. Duodenal ulcer before operation. Note highly acid resting juice, rapid emptying of stomach; hyperchlorhydria.

FIG. 7.



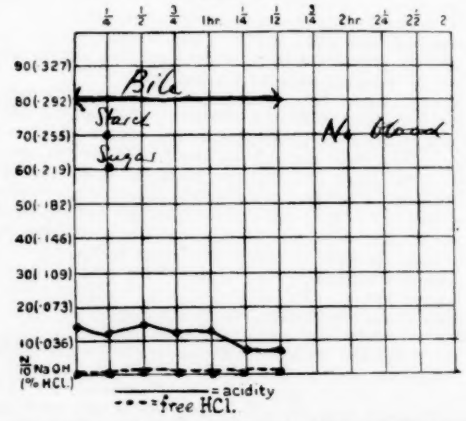
Same patient as Fig. 6. Duodenal ulcer after gastro-jejunostomy. Note high total acidity resting juice, but the free hydrochloric acid is diminished. During the meal the total acid reaches as high a level as before operation, whereas the free hydrochloric is slightly diminished. Bile present throughout; rapid emptying of stomach.

FIG. 8.



M. W., aged 39 (16/10/1920): Carcinoma pylorus. Note presence of blood and low degree of free acid.

FIG. 9.



Same patient as Fig. 8 (15/4/1921): After gastro-jejunostomy and partial gastrectomy. Note diminished total acidity and free acid; bile present throughout. Absence of blood in second meal.

ulcers (simple or with stenosis); (3) duodenal ulcers. Growths form a fourth group, regardless of type of operation.

(*b*) No matter the type of operation (e.g., gastro-jejunostomy alone or together with excision of the ulcer), in prepyloric ulcers the curves obtained before and after operation differ in that the free hydrochloric acid is diminished, but the total acidity reaches roughly its previous level; bile enters the stomach during the meal, and the stomach is emptying more rapidly than before.

(*c*) Pyloric ulcers, after gastro-jejunostomy, have the same type of curve as before operation.

(*d*) Duodenal ulcers have a highly acid resting juice, with a slightly diminished free hydrochloric acid, and the remaining part of the curve reaches about the same maximum as before, although it may be obtained quicker after operation.

(*e*) Carcinomata have a low free and total acidity both before and after gastro-jejunostomy.

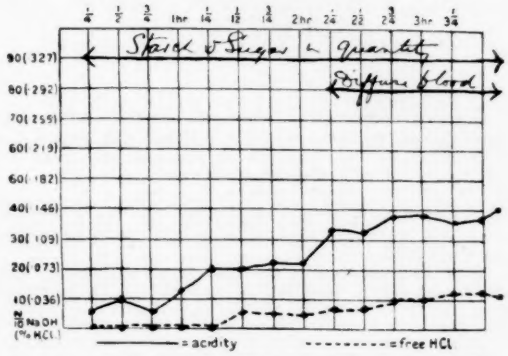
(*f*) In all cases of gastro-jejunostomy the stomach is emptying quicker than before the operation.

(*g*) In all cases a varying amount of bile gets into the stomach during some part of the meal.

(*h*) In all cases when the gastro-jejunostomy has been successful, pain has been relieved.

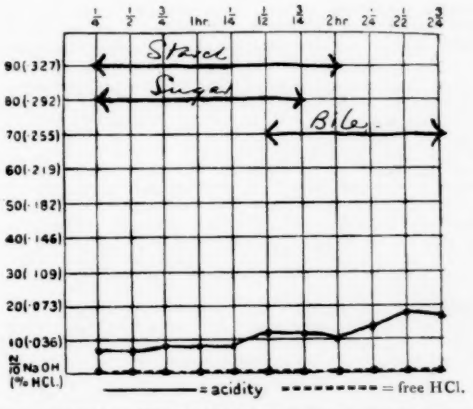
(*k*) In most cases of simple ulcer weight has been put on.

FIG. 10.



A. C., aged 51 (9/1/1921): Carcinoma ventriculi. Note great delay in emptying of stomach. Low free acid; presence of blood.

FIG. 11.



Same patient as Fig. 10 (27/6/1921) after gastro-jejunostomy. Note presence of bile; no visible blood; stomach emptying more quickly than before. No free acid in second meal.

I should like to take this opportunity of expressing my thanks to the surgeons and assistant surgeons of Guy's Hospital for the facilities they have given me to make use of their cases, and particularly to Dr. Ryffel and Dr. Ryle for numerous suggestions and advice on the varying difficulties that had to be overcome.

GENEVA MEDICAL SOCIETY.—Dr. F. G. Crookshank will deliver the Revilliod-Julliard Lecture on Thursday, Nov. 10th, the subject being the Traditions and Development of British Medicine.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—The first meeting of the session was held at the Miller Hospital, Greenwich, on Oct. 14th. Dr. C. T. T. Comber was elected President and on taking office remarked that the society was the olde t local medical society in the London area, being instituted in October, 1856. Mr. Cecil A. Joll showed a female patient of 79 years of age from whom he had removed part of the stomach. Dr. H. Nockolds showed a curious case of generally distributed and painful bony tumours which had been present from birth. Dr. Montague Hine showed two cases of glaucoma, a case of complete ophthalmoplegia externa, and an injury to the retina due to a shrapnel wound of the cheek. Mr. Hugh Davies showed part of the stomach removed from a woman aged 75 years very similar to the case of Mr. Joll. Dr. E. P. Cumberbatch showed a case from whom he had removed a bony growth from the heel by caustic potash and ionisation.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF *CYSTICERCUS CELLULOSÆ* IN MAN.

BY JAMES R. HUGHES, M.A., M.B., B.S. DURH.,
PHYSICIAN TO THE MINISTRY OF PENSIONS HOSPITAL, NEWCASTLE-ON-TYNE.

THE following case of *Cysticercus cellulosæ* occurring in an army pensioner is of sufficient rarity and interest to merit record.

J. V. B. was admitted to this hospital on Jan. 24th, 1921, with the invaliding disability of malaria and an indefinite history of fits. During the routine case-taking examination of this patient it was found that he had what appeared to be several subcutaneous nodules, varying in size from that of a pea to a cherry. The body distribution was as follows: One at the angle of the right lip, three on the front of the chest, 15 on the back and posterior aspect of the neck, and five on each of the arms and legs. As the nodules seemed roughly to follow the line of the cutaneous nerves a provisional diagnosis of multiple neuro-fibromata was made pending the removal and examination of one of the nodules.

On the 30th three of the small tumours were excised. During the process of removal it was found that the nodules were intramuscular cysts, being covered by a few muscle fibres, subcutaneous tissues, and skin.

Following is a description of the condition found:

(1) Each individual cyst really consisted of two, an ectocyst and an endocyst. The wall of the ectocyst was composed of dense fibrous tissue, reactive from the patient.

(2) On opening the wall of the ectocyst about half a c.cm. of serous fluid escaped and the endocyst was exposed; this was the true *Cysticercus cellulosæ*.

(3) The wall of the smaller cyst—i.e., the *Cysticercus cellulosæ*—was the caudal vesicle of the worm, into which the worm's head and body were invaginated like a glove turned partly inside out. We were able, by gentle pressure, to evaginate these parts of the worm from its caudal vesicle, through a very small aperture in the cyst wall. The head carried four suckers and a rostellum armed with a double row of chitinous hooks.

Signs and symptoms.—The patient complained: (*a*) That he had fits, about one every four weeks; (*b*) that whenever he had a high temperature, whether from malaria or from other causes, the "little lumps" become very sore. With regard to the fits, he was observed in three of these during his stay in hospital; they were not epileptiform in character, but were more like vertigo. There were no localising signs of a cerebral tumour; the patient's cranial nerves, as well as his deep reflexes, were quite normal. There was no history of headaches, or of vomiting, nor was there any error of refraction present; the fundi oculi were quite normal. Several blood counts were taken; an average of these showed red blood corpuscles 5,675,000, white blood corpuscles 14,375, and of the white blood corpuscles 20 per cent. were consistently eosinophiles.

History.—A brief account of the patient's life before his admission to hospital may be of interest. Born in London, in 1885, he lived there until 1908, employed for some years as a horse-breaker; he was always healthy. He joined the Regular Army in 1908 and went direct to India, where he was stationed for six years, during which period there was no history of any illness. He stated that he never bathed in rivers or lakes, but that when in India he used to drink rain-water. He returned to England in 1914 and was drafted to Salonica in 1917; at this latter place he contracted malaria in 1918. During the latter year he noticed "little lumps" forming in the skin of his face and on the back of his neck.

Treatment.—In addition to treatment of the malaria every attempt was made to rid the patient of the cysticerci. A concentrated course of intravenous neokharsivan was given without any apparent benefit. Following this a course of antimony tartrate intravenously was tried, but with little or no appreciable result. The third method of treatment was purely local and was of some benefit; it consisted of puncture of the superficial cysts with a hypodermic needle and injection of carbolic acid in glycerine (20 per cent.) into them. A brisk local reaction occurred, but it was followed by the disappearance of the cyst in a day or two. Unfortunately, it was only the most superficial cysts that could be treated in this way. In all 18 cysts have been destroyed, but numerous others are probably present in the deeper tissues.

Mode of infection.—It is an acknowledged fact that if man eats "measly pork"—viz., pig's muscle in which *Cysticerci cellulosæ* are embedded—he will develop the adult *Tænia solium*, which will live as a parasite in his intestines. If, however, he unfortunately ingests, either in his food or drink, the ova or an egg filled segment of the *Tænia solium* he stands a chance of infection with the encysted embryonic form (i.e., *Cysticercus cellulosæ*) of the tape-worm, and may himself become "measly." Man seems to be particularly immune from this condition, and I have only been able to trace six prior brain-cases in the literature [1] as having occurred in Great Britain. When, thus rarely, the ripe ova of the tape-worm find their way into the human stomach their shell is dissolved by the gastric juice; the freed embryos pass, by means of their hooklets, through the walls of the stomach or intestines, and are dispersed by the blood-stream into all parts of the body, but they seem to have a particular tendency to settle in the brain, spinal cord, and the inter-fascicular connective tissue of the muscles. Küchenmeister, whilst experimenting on condemned criminals in 1855,[2] and Leuckart in 1856, found that auto-infection could occur—viz., that a patient harbouring tape-worms could infect himself with *Cysticercus cellulosæ* either by contaminating his food-stuffs with hands soiled with ova, or by regurgitating the ova or ripe segments of the worm during the act of vomiting.

Exactly how this pensioner became infected is purely a matter for speculation. He had never, to the best of his belief, passed a tape-worm, and certainly did not pass one during his stay in hospital, as his stools were most carefully examined, against a dark background, after the administration of large doses of anthelmintics. It is possible that he ingested the ova or a ripe segment of a tape-worm in the rain-water that he used to drink whilst in India.

I am permitted to publish these notes by the kind permission of Colonel F. J. Greig, C.M.G., A.M.S. (R.), medical supt. of the hospital, and of Dr. D. Wells Patterson, the consulting physician.

I am indebted to Dr. P. C. Laws, bacteriologist to this hospital, and to Mr. T. W. Flattely, lecturer in zoology at Armstrong College, Newcastle-on-Tyne, for their kind help in examining the cysts with me, and for making serial microscopical sections of them.

References.—1. Peachell, G. E.: Case of "Status Epilepticus" and Death due to Cerebral Cysts of *Cysticercus Cellulosæ*, Journal of Mental Science, 1916, lxii., p. 180. Sullivan, W. C.: Case of *Cysticercus Cellulosæ* of the Brain, Journal of Mental Science, 1903, xlix., 115. Douty, J. H.: Case of Cysticerci of *Tænia Solium* in Cerebrum and Fourth Ventricle of Twelve Years' Duration Producing Intra-Ventricular Dropsy, Insanity, Epilepsy, and Death, THE LANCET, 1886, ii., 69. Flint, F.: Case of *Cysticercus Cellulosæ* in the Ventricles of the Brain; Sudden Death, THE LANCET, 1881, i., 574. Brittan, F.: *Cysticercus* in the Brain (two cases), THE LANCET, 1881, i., 639.

2. Küchenmeister, F.: Wiener medicinische Wochenschrift, 1855 and 1860. Leuckart, R.: Blasenbandwürmer, 1856.

A CASE OF GENERAL INFECTION BY *CYSTICERCUS CELLULOSÆ*.

BY H. K. ABBOTT, M.D. DUB., D.P.H.,
MEDICAL SUPT., MENTAL HOSPITAL, KNOWLE, FAREHAM.

THE following case of general infection by *Cysticercus cellulosæ* is sufficiently uncommon to be of interest. The disease was believed to have been contracted in India.

A female patient was admitted to the Mental Hospital on July 13th, 1918, suffering from melancholia and with a history of headache and dimness of vision for two months, having also had two fits with transient weakness of left side a fortnight before admission. Her general condition was fairly good and she talked rationally but was very depressed. She complained of pain on left side of head; there was deafness in left ear; sight in both eyes was so diminished that she could not read newspaper headings; no sign of hemiplegia. There were numerous small shotty sub-

cutaneous nodules, especially on the right upper arm, which appeared, according to the patient, about seven months before. Before coming here the eyes were examined by Captain P. J. Hay, R.A.M.C., who reported as follows: Two local detachments of the retina of right eye due to cyst-like bodies behind; deficient vision in left eye, apparently due to opacities in the lens; fundus normal. No ova of parasites could be found in the stools, and the urine was normal. The Wassermann reaction was negative and the blood count showed only slight lymphocytosis. One of the small cysts was excised from the right arm and sent to the London School of Tropical Medicine and reported to be *Cysticercus cellulosæ*, and the opinion was expressed that she must have been both the direct and intermediate host of this parasite. There had been no sign of the intestinal infection while in hospital. She improved gradually in mental and bodily condition and was discharged recovered in December, 1918. She was readmitted on July 18th, 1919, again suffering from melancholia, and was said to have been upset by the sudden death of her husband. Early in 1921 she developed tuberculosis. The disease made rapid progress and she died on Sept. 14th.

Post mortem it was found that the whole convex surface of the brain was studded with cysts, as was also the heart. Neither organ was opened, as I wished to send them to the museum of Trinity College, Dublin. The subcutaneous tissue of arms, thorax, and abdomen was full of cysts, and the peritoneum was profusely studded with them. There were none in the lungs, liver, kidneys, or spleen, but the lungs were full of tubercle.

A CASE OF ACUTE TETANUS,

SUCCESSFULLY TREATED WITH LARGE DOSES OF ANTITETANIC SERUM.

BY C. E. SHATTOCK, M.S. LOND., F.R.C.S. ENG.

THE following case of acute tetanus, successfully treated with large doses of antitetanic serum (A.T.S.) would seem worth recording, as showing the large quantity of A.T.S. which may be safely given in early childhood.

F. L., aged 3½ years, injured the tip of one finger in a street accident. She was noticed not to be well and to stumble when walking 11 days after the accident. On the twelfth day she could not get food into her mouth, and in the evening "fits" began, the child becoming stiff whenever she was touched. One thousand units of A.T.S. were given subcutaneously by her doctor on the thirteenth day, and a further 1500 units subcutaneously early on the fourteenth day. When the patient came under my care (Sept. 29th, 1920), the fourteenth day after the injury, she showed generalised rigidity, most severe in the arms; there were marked trismus and some opisthotonos. The facial muscles showed tremors, the reflexes were increased, and the child was sweating profusely. Pulse 148, respiration 36, temperature 100·4°. There was a sloughing wound on the tip of the injured finger. A.T.S. was administered as shown in the table:—

Date in 1920.	Intravenously.	Intramuscularly (each injection, 750 units).	Subcutaneously.
28.9	—	—	1000 units.
29.9	4500 units.	3 injections.	1500 ,,
30.9	4500 ,,	4 ,,	—
1.10	—	5 ,,	—
2.10	—	4 ,,	—
3.10	—	3 ,,	—
4.10	—	2 ,,	750 units.
5.10	—	—	750 ,,

The patient was anæsthetised for the intravenous injections, the serum being diluted with saline; the terminal phalanx of the injured finger was amputated whilst the first of these injections was given, the wound being left open and subsequently dressed frequently with H_2O_2. Chloral, gr. v., with pot. brom., gr. x., was administered two-hourly during Sept. 29th and 30th, and was then continued in the same dosage four-hourly until Oct. 14th.

The patient's general condition improved greatly during the first 48 hours of treatment, but the general rigidity passed off slowly, being quite noticeable on Oct. 7th. The jaw was still slightly stiff on the 12th. On the 19th the child seemed perfectly well. The total number of units of antitetanic serum given to this child was: intravenously, 9000; intramuscularly, 15,750; subcutaneously, 4000.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

A MEETING of this society was held on Oct. 24th, Mr. JAMES BERRY, the President, being in the chair, when Sir ARCHIBALD GARROD opened a discussion on

THE MODERN TREATMENT OF DIABETES.

He called attention to the advances made, in recent years, in the study of diabetes and allied conditions; the estimation of sugar in the blood, as well as in the urine, had thrown much light upon the metabolic disturbances, and had given valuable indications for prognosis and treatment. Such estimations, for which only minute quantities of blood were required, enabled us to distinguish between cases in which the blood-sugar was high, normal, or subnormal, and to study the response to the administration of doses of glucose. We were learning that the prognosis of diabetes was not so uniformly gloomy as was formerly thought, and that there were cases to which the name of diabetes innocens might rightly be applied. The "threshold," by which was meant the degree of glycæmia above which sugar begins to appear in the urine, was a matter of interest and importance, and there were indications that the patient might protect himself, to some extent, by a raising of this threshold. Sir Archibald Garrod said that it had been recognised for some long time that the tolerance of the patient for carbohydrates became impaired progressively as the disease continued, and that by dietetic restraints it was possible to bring about some recovery of tolerance, with the result that after a period of "alimentary rest" the patient could take larger quantities of carbohydrate food without passing sugar in his urine. Of recent years much attention had been directed to the part played by the substances of the acetone group, and especially by aceto-acetic acid, in diabetes, and in the production of diabetic coma. We had learnt much as to the sources of these products in the body, and the influence of restrictions of diet upon their production. The prime objects aimed at in the dietetic treatment of diabetes were the reduction of the amount of sugar in the blood, and the consequent resting of the damaged mechanism, and at the same time the avoidance of over-production of the acetone bodies. Sir Archibald Garrod sketched the progress of dietetic treatment from its inception by Rollo in the early part of the nineteenth century, through the period during which the elimination of carbohydrate from the diet was the chief aim; he recalled the gradual improvement of that method and the recognition of the danger of too abrupt or rapid restrictions. He alluded to the Guelpas plan of treatment by fasting days and copious purgation, to the oatmeal treatment of von Noorden, and lastly to the most modern plans of treatment introduced by Allen in America, and by Graham in this country. These two plans of treatment were reached independently along different lines; both relied largely upon fasting days, and both produced results far better than had been obtained on any previous plans. Timidity in imposing fasting days, on the ground that starvation induced acetonæmia, has proved to be unjustified; far from increasing acetonæmia, fasting days tended to diminish or remove it. Sir Archibald Garrod described the modern treatment of diabetes as based upon the value of periods of alimentary rest in restoring carbohydrate tolerance; i.e., on the facts which Allen had brought out clearly, that a diabetic patient did best when somewhat underfed, and that restriction of protein and fat was no less important than restriction of carbohydrates. Patients treated by modern methods seldom passed sugar in their urine, and in hospitals it was often difficult nowadays to find specimens of sugary

urine for examination. The modern patient led his life in much greater comfort, and we were justified in believing that as long as he conformed to treatment his expectation of life was much increased. These were no small gains; but, concluded Sir Archibald Garrod, whilst our control of the malady was now much more efficient we were unfortunately still as far as ever from being able to cure our patients.

Mild and Severe Types of Diabetes.

Sir WILLIAM WILLCOX said that cases of diabetes varied enormously in severity, the milder types being more commonly treated by the general practitioner, while hospital cases were, as a rule, of the severer type. The milder type, called by Pavy "alimentary diabetes," could be recognised clinically by the condition of the patient, who did not exhibit wasting, and in whom thirst and polyuria were not marked. Usually acetone and diacetic acid were absent from the urine, although sugar might be present in high percentage. In cases of this type treatment by a short period of fasting quickly banished sugar from the urine, and the carbohydrate tolerance was then gradually determined by a graduated dietary of known carbohydrate content. Sugar should not be permitted, and the treatment of such cases consisted in so regulating the diet that the urine remained sugar-free. Sir William Willcox said that certain cases of this type occurring in well-nourished and plethoric patients only exhibited glycosuria after such indiscretions in diet as alcohol or excess of meat, quite apart from carbohydrate. A careful regulation of all the constituents of the diet should be insisted on, and toxic causes of glycosuria sought for and removed. The severe type of diabetes was associated with a more or less complete impairment of the pancreatic function of control of the carbohydrate metabolism. In very severe cases pancreatic control appeared to be permanently lost. Such cases were incurable, although the symptoms might be to a great extent alleviated. The pancreas from its deep-seated position in the body was incapable of physical examination, and irreparable damage might occur to the islands of Langerhans without any warning. No premonitory symptoms such as occur in the case of the liver became evident, and glycosuria was the first sign of damage which had already been effected.

Toxic Foci to be Removed.

The first step in the treatment of diabetes should be the detection and removal, if possible, of the cause; and the true cause of diabetes was damage to the pancreas by some toxic agent, in many cases no doubt bacterial. Sir William Willcox had seen severe glycosuria associated with carbuncle disappear after successful treatment of the septic lesion. In such a case it appeared that the toxins absorbed caused temporary arrest of the pancreatic function. Temporary glycosuria was well known in mumps, and numerous cases of glycosuria in syphilis had been cured by anti-syphilitic treatment. In several of the speaker's cases of diabetes bacteriological investigations had revealed abnormal intestinal infections. In one case the stools contained an excess of pathogenic streptococci and a non-lactose-fermenting Morgan's bacillus. In this case there was a history of catarrhal jaundice followed three months later by severe influenza, glycosuria being accidentally discovered six months later. Sir William Willcox did not think that the importance of the removal of possible toxic foci had been sufficiently realised in the treatment of diabetes. In every case it was of the utmost importance to make a most careful search. Examination of the tonsils and naso-pharynx, X ray examination of the teeth, bacteriological examination of the stools and urine, the Wassermann test, and so forth, should all be carried out, and any source of toxic poisoning found appropriately treated. Unfortunately many of the severe cases of diabetes were not seen until the pancreas had already suffered irreparable damage, and in such cases little could be expected from treatment.

The Routine of Treatment.

Sir William Willcox said that during the last two and a half years all his cases of diabetes at St. Mary's Hospital had been treated on the lines laid down by Allen and Joslin. Glycosuria had been removed in all cases, and marked improvement had occurred in all but one patient, who also suffered from advanced phthisis. During the patient's stay in hospital the carbohydrate, protein, and fat tolerance was determined and alternative diets were drawn up which were well below the limits of his tolerance, so that the regulation of the dietary had been possible after the patient left hospital. The patient was further instructed to test the urine, and carry out regular fasts; with occasional supervision glycosuria had either been prevented or at least kept under control. In severe cases with low carbohydrate tolerance, two ounces of whisky might be added to the diet, thus providing a much-needed 210 calories, and giving the patient a sense of well-being. Alcohol should not be given on fasting days, and was best avoided in milder cases. The early signs of acidosis should always be carefully looked for and fat and protein withdrawn from the dietary and carbohydrate reduced to 1 g. per kilo. of body-weight in the form of oatmeal and orange juice. Alkalies, although they did not neutralise the toxic group in aceto-acetic acid, helped by increasing the CO_2 elimination. He gave citrate and bicarbonate of soda in doses of 40 gr. every two hours in cases of threatening acidosis, with beneficial results. During the last year, at the suggestion of Prof. B. J. Collingwood, he had given glucose solution by the rectum in 10 severe cases. The amount of glucose so administered greatly exceeded the carbohydrate tolerance, but in no case did glycosuria result. Analyses of the fluid in the rectum made it clear that more than 25 per cent. of the glucose had been absorbed. He thought this might be useful in cases of acidosis with threatening coma. Drugs were not usually needed, other than alkalies for acidosis, but Sir William Willcox said he had found codeine in doses of ½ to 1 gr. t.d.s. useful in controlling the glycosuria in patients who must of necessity carry on their work.

Three Groups of Patients.

Dr. O. LEYTON said that for purposes of treatment patients suffering from diabetes mellitus should be divided into three groups. The first group consisted of patients who had comparatively recently developed the disease, were over 40 years of age, and in all probability came into this world with undersized pancreases and oversized appetites. After years of overwork the pancreas began to degenerate. This degeneration might be arrested if the work thrown upon the gland were decreased. Allen's experiments upon dogs, from which he had removed fractions of the pancreas, suggested the existence of this group. Allen found that a dog could live with one-sixth of its pancreas intact provided it was not overfed; whilst a dog with half its pancreas could be made to develop diabetes mellitus and die from it, provided it was systematically overfed. One might assume that the individual developing diabetes mellitus had a congenitally small pancreas since all gourmands did not develop diabetes mellitus.

The second group consisted of patients in whom acute diabetes had developed comparatively recently. Occasionally the onset was associated with some definite disease, or with a slight pyrexia suggestive of an infective origin. Dr. Leyton had seen quite a number of young people who had given similar histories—namely, that they had felt feverish, had been sent to bed for a few days by their doctor, and had attributed their thirst to the fever, but that after getting up the thirst had persisted. This had led to an examination of the urine which demonstrated sugar.

The third group consisted of all those cases in which the pancreas had deteriorated to such an extent that it was impossible to find a diet possessing sufficient energy to maintain life and keep the blood-sugar normal. This group contained the patients who earlier

might have belonged to group 1 or 2 and in whom the disease had been neglected or treated incorrectly; but in addition to these cases, in some patients the disease was progressive in spite of the most skilled modern treatment, possibly due to a chronic infection of the pancreas. Apparently chronic infection was not essential, for in many cases in which the alteration in the pancreas seemed to have been arrested, toxin resulting from an incidental infection such as tuberculosis, influenza, or malaria, might cause progress in the disease.

Appropriate Restricted Diet.

Dr. Leyton said that the treatment of these three groups might be termed a treatment of restricted diet. Restricted diet by itself was sufficient in group 1. Usually these patients had a blood-sugar in the region of 0·2 per cent. about two hours after a meal containing carbohydrate, but no evidence of an acidosis. In these cases the blood-sugar fell to normal upon restricting the daily diet to: carbohydrate 20 g., protein 50 g., fat 50 g. When this diet had been taken for seven days and the blood-sugar had fallen to normal, a daily increase in the carbohydrate was made and the blood-sugar was estimated at intervals. Directly the blood-sugar began to rise above the normal the quantity of carbohydrate was reduced. Protein might then be raised perhaps up to 2 g. of protein per kilo body-weight, provided the blood-sugar did not rise; and then, finally, fat might be increased until the number of calories per kilo per diem became 30, or the blood-sugar rose or some evidence of acidosis developed. The treatment of the second group was much less easy; the removal of sugar from the urine was simple, but the elaboration of a diet which would arrest the progress of disease in the diabetic and allow the patient to live indefinitely was far from simple.

Most important was the eradication of any infection. Recently attention had been drawn to a condition called "sapræmic glycosuria." Assuming that such a condition existed, Dr. Leyton pointed out that to treat true diabetes mellitus in association with a sapræmic glycosuria would be beyond the skill of any man with the present methods of investigation, for in sapræmic glycosuria the sugar in the blood and the sugar in the urine was increased. Pyorrhœa alveolaris, pustules, and infected tonsils all led to an alteration in metabolism which made the estimation of the optimum diet impossible. Dr. Leyton quoted cases in support of his contention that infection affected the metabolism and that the amount of toxin necessary to change the metabolism was minute. The ideal diet for the diabetic was one in which sufficient energy was supplied in the food whilst the sugar in the blood did not rise above 0·12 per cent. and no excess of any acid or acetone appeared in the urine. In the more severe cases of diabetes mellitus this ideal diet could only rarely be attained, although frequently a diet could be found in which glycosuria was absent, while the blood-sugar rose to 0·18 per cent. Dr. Leyton's experience showed that in these cases the disease was progressive, and therefore the problem resolved itself into the decision how far the patient should be submitted to the inconvenience of a very limited diet in order to prolong life for some months or perhaps years. In some cases a patient would not submit to any very great restriction without a reasoned argument. The opportunity of discussion with the patient should be afforded to the consultants in such cases. Dr. Leyton said that in a certain number of cases belonging to group 3 the patient's urine could not be freed from sugar. The majority of these cases were either very advanced, or were suffering from pulmonary tuberculosis. By giving large doses of atropine and codeine sugar might sometimes be expelled from the urine, but it had not been his custom to use this method. In Dr. Leyton's opinion, when it became evident that life could not be prolonged indefinitely, the object of treatment was completely changed; a diet had then to be arranged whereby the patient would get the most satisfaction out of the remainder of his life.

The Importance of the Blood-sugar Curve.

Dr. W. LANGDON BROWN said that true diabetes was characterised by an exaggerated katabolism involving all the foodstuffs. Since carbohydrate formed about 70 per cent. of the normal diet and yet was not present in the tissues to more than 1 per cent. of the body-weight, it was clearly the most rapidly metabolised food; hence it would be the first affected in exaggerated katabolism. Dr. Langdon Brown brought forward observations to show that carbohydrate tolerance varies with the total metabolism. The success of treatment by alimentary rest depended on the way that it could slow down the whole of the metabolism. The special point to which he wished to call attention was the guidance that can be obtained in treatment by investigation of the blood-sugar curve in glycosuria. It had generally been assumed that hyperglycæmia preceded glycosuria, but by following up the course of a case it might often be seen that in the earlier stages hyperglycæmia was slight and transitory, becoming much more marked later on, showing that the kidney was capable of raising its threshold for sugar. Dr. Langdon Brown showed a number of curves illustrating (1) the normal response of the body to the ingestion of sugar; (2) cases with a low threshold, the so-called renal type, which required no treatment; (3) cases of obesity with consecutive glycosuria, showing an impaired power of storing sugar as glycogen; (4) cases of exophthalmic goitre, showing marked delay in dealing with ingested sugar, with consequent hyperglycæmia but not necessarily any glycosuria; (5) cases of transitory or intermittent glycosuria where the sugar curve showed a short, sharp rise above the threshold, but a normal fall. For this type he did not advise abstention from starch, usually abstention from sugar as such was sufficient. The next series of curves, (6), showed mild and intermittent forms of the disease, some of which were suitable for treatment by alimentary rest, while others did better with more lenient methods. The final group, (7), were cases of severe diabetes, practically all showing continuous hyperglycæmia with an extraordinarily sharp rise and then fall after administration of dextrose. In all these alimentary rest seemed strongly indicated, and Dr. Langdon Brown quoted instances of the good effect of this treatment. In two cases he had observed the threshold for sugar pushed up so much that the blood held a considerable quantity of sugar and only a small amount escaped into the urine in a manner recalling the renal type, since it varied little with the diet. The blood-sugar curve was, therefore, necessary to distinguish a case of this sort which required active treatment from one of the renal type where no treatment was called for. After experience of both Allen and Graham's methods of treatment by alimentary rest, he had come to the conclusion that although Allen's plan might rid the urine of sugar more quickly it was more trying to the patient than Graham's, and the ultimate results of the latter appeared to him as good.

The Education of the Patient.

Dr. E. I. SPRIGGS said that the fasting treatment in diabetes had been used at Duff House for six years. The first 18 months' experience of the method was described in a discussion at the Royal Society of Medicine in May, 1916.[1] Subsequent work had confirmed the good report of the method then given. Dr. Spriggs wished to speak on two points—first, the importance of the education of the patient so that he could coöperate with his doctor in the treatment, and, secondly, on the home-made manufacture of a starch- and fat-free bread substitute. The preliminary examination of the case should be made under medical care, with daily examinations of the urine, frequent blood-sugar estimations, and a weighed diet. On the results of this investigation, which might take from a fortnight to six weeks, a scheme of diet should be drawn up. The carrying

[1] Proceedings of R.S.M., 1916, vol. ix. (Therap. and Pharmac. Section), pp. 76–90.

out of the diet in the home depended, as a rule, upon the patient, who should know the why and wherefore of each step and be able to make simple changes for himself. Dr. Spriggs had recently introduced at Duff House a short course of instruction for patients while their cases were being investigated. A class was held by the diet sister, in which patients were shown how to weigh certain portions of food accurately and how to make special dishes, including diabetic bread. In the chemical laboratory instruction was given in the collecting and measuring of urine, and, in certain cases, its testing. The scheme included also simple instruction by a doctor in the nature of food and food-stuffs, food values, the reasons for the dietetic measures adopted in diabetes, and the construction of the patient's own diet. A selection was made of the patients who would be invited to attend the course or any part of it. In the young, with well-marked diabetes, anxiety and apprehension might be engendered, but the judicious instruction of patients about diet need not make them as apprehensive as they used to be in former days on a diet of abundant protein and fat, on which glycosuria and symptoms were increasing. The time for which a serious breakdown of metabolism could now be postponed in young patients was still unknown, but it was certainly several years longer than formerly. While laying stress on the value of keeping the urine free from sugar it was important not to give the patient the impression that all was lost if this result could not be attained, since experience showed that many people who could not be kept free from sugar could live and work.

With older patients and less severe types the closest collaboration of the patient and the fullest knowledge of the modes in which the proportions of protein, carbohydrate, and fat can be varied in the diet were wholly advantageous. In such the control of his own diet by the instructed patient might postpone indefinitely the progress of the complaint. Dr. Spriggs was of opinion that every hospital should have a course of instruction for both in- and out-patients with diabetes. The expense would be trifling, and the benefit to the sufferers would be great.

Home-made Diabetic Bread.

Every doctor was aware that most of the diabetic breads offered to the public, with the exception of those made by one or two well-known firms, either contained a great deal of starch and sugar, or were unpleasant to the taste, whilst all were expensive. Messrs. Callard and the Protene Company had made products which gave fairly consistent analyses, and these were used widely. Patients were well advised to do without bread or bread substitutes altogether, eating boiled greens with meat, and lettuce or tomatoes, &c., with eggs. But the need for a bread substitute remained. A particular disadvantage, even of the reliable breads, was that they contained a good deal of fat. When the diet was being built up after fasting it was convenient to have a bread substitute which did not contain fat. After a careful trial of bran cakes, which were not found, even with the same method of preparation, to be consistently starch-free, he had suggested to the chemist and the diet sister at Duff House that fat-free casein bread should be prepared from separated milk. The method at present in use was as follows:—

Duff House Home-made Diabetic Bread.—One gallon of separated milk (cost about 6*d.*) is placed in an enamel dish and warmed, with stirring, to 100° F. A mixture of 45 c.cm. (= 1½ fluid oz.) of glacial acetic acid and 450 c.cm. water (about ¾ pint) is prepared and poured into the milk at 100° F., with constant stirring. The caseinogen separates as a white clot. The mixture is left to stand for about five minutes and then poured through muslin placed on a fine sieve for about two minutes, meanwhile working the caseinogen with the hand so that most of the other milk products and acid may be washed away. The muslin containing the precipitate is taken from the sieve, pressed, placed in a bowl of cold water, and kneaded for about five minutes. The water is now changed six times with repeated kneadings each to ensure that all traces of milk-sugar are removed from the casein. The washings are to be tested with Fehling's solution. The muslin containing the white material, henceforth called "casein," is squeezed to remove as much liquid as possible, the muslin opened out, placed on a sieve, and left on the kitchen shelf for a few hours to dry. The casein is now rubbed through the sieve on to the muslin and put back on to the shelf overnight or until it is practically dry to the touch. About 160 g. (5½ oz.) of the casein in this condition should be obtained from one gallon of separated milk.

To prepare the bread beat up the whites of two eggs to a stiff froth, add 50 g. of the above casein (nearly 2 oz.), a pinch of salt, and 2 g. each of cream of tartar and bicarbonate of soda (i.e., a teaspoonful of each powder, levelled off, but not pressed down). Mix lightly together, form into cake or cakes and bake in a moderate hot oven for 15 to 20 minutes. The tin on which the bread is baked should be greased with liquid paraffin. This gives an unpleasant smell in the oven, but the bread has no taste of it.

The casein can be prepared at any time and in any quantity at the convenience of the housewife. It is best kept in a dry place in open vessels. The bread itself is made in a few minutes by whipping up the casein with the egg white, salt, and baking powder. Sweet cakes can easily be made from it by putting in a little liquid saccharin and some desiccated cocoanut or other flavouring. When freshly baked the well-known and objectionable cheesy taste of diabetic bread is less marked in this bread than in those on the market, but it is important that it should be made and eaten fresh; this taste develops if the bread is kept long. As the making and baking take only a very short time, it is easy by keeping a supply of casein powder to make bread fresh once a day or more than once a day.

The analysis of the bread as served gave: Protein (nitrogen × 6·25), 52·5 per cent.; carbohydrate (starch and sugar), nil; fat (ether extract), 0·2 per cent.; 20 g. of it gave, therefore, approximately 10 g. of protein. In addition to its general use as a not unpleasant and inexpensive home-made bread substitute, rolls of about 20 g. are specially valuable when it is desired to increase the protein daily after fasting, without adding fat or carbohydrate.

Dr. Spriggs said that with eggs at 3*s.* 9*d.* a dozen the cost worked out at a little under 3*d.* for each 20 g. roll. The yolks of the eggs were, of course, included in the price, but would be used for some other purpose, such as for custard. Dr. Spriggs showed actual rolls, and also some small cakes made from the same material and flavoured with coconut.

The Treatment of Coma.

Dr. E. P. POULTON said that he agreed with the previous speakers as to the general treatment of diabetes, but wished to say something about the treatment of coma. He described a case of a comatose child of 9 whose alveolar CO_2 amounted to only 1·5 per cent.; Dr. Poulton injected intravenously 300 c.cm. of a 5 per cent. solution of sodium bicarbonate, followed by rectal dextrose, lactose by the mouth, and later by subcutaneous saline. The alveolar CO_2 rose to 5·2 per cent. on the nineteenth day. The patient was finally discharged from hospital on a diet sufficient to maintain and even to increase the weight. Dr. Poulton described the administration of saline through a tube passed into the duodenum to another patient and expressed his conviction that the introduction of saline was of definite service in diabetic coma.

Treatments Compared.

Dr. GEORGE GRAHAM agreed with Dr. Spriggs that it was most important to teach the patient a great deal about his disease in order that he might understand the details of its treatment. After the patients left hospital, it was often impossible for them to collect their urine during the whole of the 24 hours, and the patient should test the urine which was passed after the principal meal of the day. The difference between Allen's line of treatment and that used in St. Bartholomew's Hospital was not very great. The same principle of undernutrition was maintained, but whereas Allen started the diet by adding carbohydrates in the form of vegetables, at St. Bartholomew's the carbohydrate value of the diet was kept as low as possible, while the proteins and fats were increased. Allen's recent work on dogs had shown that it was much easier to convert a mild diabetic dog into a severe diabetic one by overfeeding with sugar than with starch. It was

difficult to convert a mild diabetic dog into a severe one by overfeeding with proteins. These experiments seemed to show that the practice of keeping carbohydrates very low was the right one. Allen had well said that the patient should order his life according to the size of his pancreas. Dr. Graham would prefer to say, according to the number and the health of the islands of Langerhans in the pancreas, since it had been shown by the work of Bensley and of Allen that the islands of Langerhans had specific granules and are intimately connected with carbohydrate metabolism.

"Pancreatic," "Hepatic," and "Concurrent" Curves.

Dr. P. J. CAMMIDGE said that the modern "fasting" treatment of diabetes was undoubtedly a great advance on any previous form of treatment. But it demanded considerable will power from the patient, who, in many cases, had only a bare subsistence diet. Of 143 cases treated by Dr. Cammidge by this method 52 had died, giving a mortality of 36 per cent. In some cases the treatment gave rise to disquieting symptoms from an early stage. Rapidly increasing acidosis has been reported by Allen, and Dr. Cammidge had also met with nervous disturbances—ataxia, tetanic convulsions, and pronounced œdema—which necessitated abandonment of the treatment. Allen's treatment was based upon experiments on partially depancreatised dogs, and it was assumed that the results of these experiments could be applied to diabetes in man. It was, however, only possible to demonstrate pancreatic disease post mortem in a small proportion of cases of diabetes. It must be remembered that fasting treatment gave physiological rest to other organs besides the pancreas and without some new method of testing it was impossible to decide whether Allen's hypothesis was correct. Dr. Cammidge believed that we now had such a method. This depended upon determination of the difference (called the "difference value") between the percentage of sugar and the percentage of total carbohydrates in a series of samples of blood taken before and after a test breakfast of known composition. The "difference value" in health did not exceed 0·006 per cent. fasting; as the blood-sugar rose after breakfast the "difference value" might fall slightly, to rise again as the percentage of sugar in the blood diminished. It should never exceed 0·01 per cent. In a partially depancreatised dog the fasting "difference value" was always abnormally high. After a mixed meal it fell for several hours while the blood-sugar curve rose. A similar relation between the blood-sugar and "difference value" curves was found to occur in cases of pancreatitis in man. Dr. Cammidge therefore thought that the method when applied to diabetes might help in deciding whether the disease was or was not due to pancreatic lesions. A few of the cases tested gave typical opposed or "pancreatic" curves, but others showed a different type of curve which could be reproduced in animals by interference with the functions of the liver, and which Dr. Cammidge therefore termed the hepatic type of curve. There was a third ("concurrent") type of curve which was still being investigated.

Of 140 cases of diabetes investigated by this method, 45 showed "pancreatic" curves, 48 "hepatic" curves, and 34 "concurrent" curves. It would therefore appear that clinical diabetes was not a simple entity, but a symptom complex which might develop along at least three lines of which disturbance of the pancreas was only one. We could now understand why no one system of treatment would yield uniformly satisfactory results in all cases; the fasting treatment most nearly attained a satisfactory result probably because it secured physiological rest for other organs besides the pancreas. Dr. Cammidge had found that the pancreatic type exhibited rapid improvement, whereas the hepatic type did not do so well under the fasting treatment, and, indeed, was apt to develop serious acidosis. Further experiment suggested that patients of the latter type were peculiarly sensitive to fats and protein, while they could tolerate a diet relatively rich in carbohydrate, and particularly in dextrinised starch. These were the patients who derived benefit from the Van Noorden oatmeal cure. Dr. Cammidge himself thought the large amount of fat advised by Van Noorden to be a mistake. By means of a modified oatmeal diet and a judicious arrangement of semi-fast or vegetable days, he found it possible to bring about a great improvement in these cases. Acidosis rapidly cleared up, and the sugar content of the blood could gradually be brought within normal limits.

Dr. F. J. POYNTON spoke of the disappointing results of the dietetic treatment of children under 8 suffering from diabetes. Even if the children remained sugar-free for months they seemed to relapse, and each time they relapsed it was more difficult to get them sugar-free. Dr. Poynton felt that we must look further than elaborate dieting for a real cure of diabetes.

The PRESIDENT said that no points of a very contentious nature had been raised in the interesting discussion, and he would therefore not call upon the opener to reply.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OTOLOGY.

A MEETING of this section of the Royal Society of Medicine was held on Oct. 21st, with the new President, Dr. LOGAN TURNER (Edinburgh), in the chair.

The Structural Type of the Mastoid Process.

Dr. Turner chose as the subject of his Presidential address the Structural Type of the Mastoid Process, based upon the skiagraphic examination of 1000 crania of various races of mankind. The contribution was profusely illustrated, and table summaries of cases were presented. It was preceded by general remarks on the position of the specialty. The President said the prestige of otology in this country lay largely in the hands of the members of that section, and that in the summer of next year an international meeting in Paris was promised. Many problems still remained for solution, and he urged younger members of the department to concentrate upon some particular piece of scientific investigation which would reflect credit on themselves and give added kudos to the position of otology in the country. The recent inauguration of a department of literary research by the American College of Surgeons was a movement which must appeal to members. Fifteen years ago Dr. Turner himself commenced issuing reports as departmental surgeon, and had ever since published a statistical survey of the work done.

Turning to the special subject of his address, he said the application of radiology to the study of the mastoid process on an extensive scale had not hitherto received the attention of anatomists, though Beck, of Chicago, had examined many in this way. The present research had been made into the skulls of men of a number of races, giving to it an anthropological interest. He commenced the study in 1913, in association with the late Major W. G. Porter, D.S.O., and shortly before the war Dr. Porter had radiographed 2000 temporal bones in 1000 crania. The following were the anatomical points inquired into: (*a*) relative frequency of occurrence of the two types of mastoid process; (*b*) the symmetry and asymmetry of the mastoid types; (*c*) the types and their asymmetry in the two sexes. On the anthropological side the inquiry had been made into the relative frequency of the two types of mastoid process in dolichocephalic, mesaticephalic, and brachycephalic crania; the mastoid types as they occurred in pure and mixed races; the development of the mastoid and frontal air-spaces in crania of a similar cephalic index and in the skulls of the same races of men. The infantile and pneumatic types of mastoid could be

recognised in the skiagram; but without stereoscopic pictures the interpretation was not always correct. A mastoid process with pneumatic spaces occurred in 79 per cent. of European skulls. In the 1000 crania, anatomical asymmetry occurred in 12 per cent., mostly that of a pneumatic process on one side, an infantile on the other. Clinical asymmetry—i.e., as contrasted with anatomical—obtained in only 7 per cent. of the skulls. In Esquimaux, Melanesian, and Polynesian crania the pneumatic processes were found greatly to preponderate, irrespective of the type of skull. The frontal sinus, like the pneumatic mastoid process, was oftenest found in the brachycephalic skull. The frontal sinuses were better represented in the crania of the mixed European peoples than in the skulls of the relatively pure races, the pneumatic mastoid processes being found chiefly in relatively pure breeds of men. There was no evidence that the frontal sinuses and the pneumatic mastoid spaces attained a similar degree of development.

Mr. ARTHUR CHEATLE alluded to the remarkably close percentages to Dr. Turner's figures which he himself arrived at by the examination of a large series of skulls.

Diagnostic Exploration of Posterior Ethmoidal Cells.

Mr. E. WATSON-WILLIAMS read a paper by himself and Dr. P. WATSON-WILLIAMS (his father) on this subject. The cells are entered with a cannula similar to that used for the sphenoidal sinus. It is passed into the nose, above or below the middle turbinate, until it rests on a point corresponding to the back of the middle turbinate in its attachment. The cell can then be washed out and the contents examined. Unless the entry is found to be easy, the attempt should not be persisted in, for pressure brings risk of disaster. To do the exploration the nose should be pushed over to the opposite side.

Vertigo Cured by Ossiculectomy.

Sir J. DUNDAS-GRANT showed a woman, aged 40, who had had attacks of vertigo with loss of consciousness and occasional double vision two or three times a month for a number of years. Sometimes she lost the vision of the right eye for about two minutes, also she had attacks of double vision. Pus had been periodically discharged from the ear since childhood. A large perforation in the attic was found, through which desquamative material protruded. After ossiculectomy she had been free from pain, and there remained only a slight "swimminess."

Result of Double Schwartze Operation.

Mr. L. COLLEDGE showed a female child, aged 6, on whom, last December, he did a Schwartze operation on the left mastoid for acute suppuration; and three days later the same was done on the right ear. In both ears the tympanic membrane had now healed, and all suppuration had ceased; a large dry cavity still persists in the left mastoid, though both sides were treated alike.

SECTION OF PATHOLOGY.

A MEETING of this section of the Royal Society of Medicine was held on Oct. 18th with Dr. W. S. LAZARUS-BARLOW, the President, in the chair.

Dr. J. C. MOTTRAM read a paper on

Observations Upon the Action of Radium and X Rays Upon the Mononuclear Leucocytes of the Blood.

He said that by direct measurements of the size of mononuclear cell in the blood of rats he had found that in the lymphopœnia following radiation the small lymphocytes were greatly diminished whilst the larger types remained relatively unaltered in numbers. This finding could account for the facts discovered by Prof. Russ and his collaborators, that the percentage decrease in lymphocytes following X radiation is more or less constant over a wide range of dosage, and that a second exposure to radiation, before regeneration has occurred, does not cause a further fall in the number of circulating lymphocytes.

Dr. W. CRAMER and Dr. MOTTRAM contributed a paper on Changes in Lymphoid Tissue after Exposure to X Rays, and in Vitamin Starved Animals.

Dr. J. A. MURRAY demonstrated sections illustrating the Dissemination along Nerve Trunks in Tar-cancer.

Prof. S. G. SHATTOCK showed a section demonstrating Dissemination along Nerve in Carcinoma of the Tongue.

Dr. A. LEITCH showed Casts of Tar-tumours in Rabbits.

Dr. C. C. OKELL read a paper on the

Sachs-Georgi Reaction in Syphilis,

the purpose of which was to give the results of a number of tests by two modifications of the original reaction. In the first method the antigen used was prepared by mixing five parts of a simple alcoholic extract with five parts of a 1 per cent. solution of cholesterol in alcohol. This was diluted with an equal quantity of saline run slowly down the side of the tube, and the tube was then shaken. More saline was then added to make a dilution of 1 in 10; the resulting fluid was a suspension of cholesterol protected by the presence of the lipoidal extract. It had a shimmering watered-silk appearance. The serum was inactivated and tubes containing 1 c.cm. of dilutions 1/10, 1/20, 1/40, 1/80, were put up. To each tube 0·5 c.cm. of antigen dilution was added; the tubes were shaken and incubated at 37° C. Readings were taken over-night and in 48 hours. Definite flocculation in any of the tubes was read as a positive reaction. Controls were, of course, included. The results of 550 tests compared with the Wassermann test were as follows:—

Total	S.G. + W.R. +	S.G. − W.R. −	S.G. + W.R. −	S.G. − W.R. +
550	138	357	7	48

Total agreement 90 per cent.

The special points in favour of using an antigen rich in cholesterol were: (1) flocculation being heavy the tests were usually simple to read; (2) the reaction was usually well-marked, even in turbid or blood-stained sera or sera preserved for several months with chloroform; (3) only 1·27 per cent. of cases gave a positive Sachs-Georgi reaction and negative Wassermann reaction, so that where the Sachs-Georgi was used in place of the Wassermann only a small percentage of patients would be unnecessarily submitted to treatment.

The second method employed was the Dreyer-Ward[1] modification. Dr. Okell said that the features of this modification were: (1) The serum dilutions start low 1/1·25 or 1/2·5, and go up to 1/462; (2) the lipoidal extract is prepared by Bordet's method and appears to be very constant—the cholesterol content is low; (3) the standardisation of apparatus and methods, the whole technique being similar to Dreyer's standard agglutination methods; (4) the ease with which flocculation can be read against the controls which are opalescent in appearance but free from visible particles; (5) the test is claimed to be particularly useful for following the results of treatment; and (6) high percentage of agreement with the Wassermann reactions. The disadvantages were: (1) The reaction is somewhat more difficult to carry out than the original Sachs-Georgi reaction; (2) more serum is required; (3) the serum should be free from contamination or turbidity and must not contain preservative; and (4) seven hours incubation in a water bath at 37° C. are sometimes difficult to fit in with the ordinary laboratory routine. Dr. Okell said he had found that all the small technical details accentuated by Dreyer and Ward must be carefully observed if good results were to be obtained. His results were:—

Total	S.G. + W.R. +	S.G. − W.R. −	S.G. + W.R. −	S.G. − W.R. +
177	67	105	3	2

Giving 97 per cent. agreement between the reactions.

[1] THE LANCET, 1921, i., 956.

SOCIETY OF M.O.'S OF INFANT WELFARE CENTRES AND SOCIETY OF M.O.H.

A JOINT meeting of these societies was held at University College, London, on Oct. 20th, with Dr. H. C. CAMERON in the chair.

Dr. CAMERON, representing the Society of Medical Officers of Infant Welfare Centres, presented the report of the subcommittee recommending amalgamation of this Society with the Society of Medical Officers of Health.

Prof. H. R. KENWOOD, representing the latter Society, supported the adoption of the report. His Society, he said, was becoming very representative, including all those engaged in public health work of any kind. It was at that moment contemplating the formation of a section for maternity and child welfare. Each of its groups was autonomous except for questions of general policy. The groups had a one-third representation on the Council; groups were already formed all over the country. The Society of M.O.H. would welcome amalgamation with the Society of M.O.'s of Infant Welfare Centres. All members of the latter, whether working for municipal or voluntary centres, would be eligible.

Dr. A. B. MCMASTER proposed and Dr. H. RONALD CARTER seconded the adoption of the report, and this was carried unanimously.

The committee of the newly-formed group of the Society of M.O.H. was then elected with power to appoint its own officers.

Dr. CAMERON then read a paper on

The Nature of Summer Diarrhœa.

He maintained that the usual belief that summer diarrhœa was due to an organism conveyed in milk, communicated directly from child to child and disseminated by the house-fly, was not proved. Heat was said to act indirectly by encouraging the bacterial decomposition of milk. The weight of evidence, in his opinion, went rather to prove that it was due to the direct action of heat on the unstable heat centre of the infant. It was admitted by all that contamination of milk with streptococci or other pathogenic organisms is capable of producing epidemics of diarrhœa: but that the mere multiplication of the usual milk saprophytes could produce diarrhœa Dr. Cameron maintained that we had no evidence. In spite of present-day methods of milk sterilisation the dangers and difficulties of the artificial feeding of infants were still with us. Infants fed on the breast, cow's milk, dried and condensed milks and proprietary foods were alike affected. The mortality of infantile diarrhœa resulted from several types of disease all favoured or caused by persistently high temperature. Dr. Cameron described the effect of the latter upon infants and concluded that the great summer mortality was not entirely or chiefly due to infective enteritis, the result of the contamination of the milk-supply, but was to be attributed to the prejudicial effect of heat (1) in lowering the need for food and the tolerance for food, (2) in diminishing the force and activity of the digestive secretions, (3) in encouraging the overgrowth and migration of bacteria, which are normal inhabitants of the colon, in other parts of the bowel. He divided summer diarrhœa into four groups: (*a*) group showing some disturbance of the heat-regulating mechanism together with digestive disturbances of greater or less severity; (*b*) a group comprising cases of acute catarrhal or follicular colitis and a few in which the bacilli of dysentery have been found; (*c*) a group of cases of "heat stroke" in which cerebro-spinal symptoms are the most prominent; (*d*) a terminal state of "intoxication," the very characteristic symptoms of which are evident in almost all cases before death. Preventive propaganda at present assumed the infective nature of the disease. It was possible that measures to assist the young child to combat the direct influence of heat would be more fruitful of results.

Dr. Cameron concluded by picturing the infant enveloped in many layers of impervious flannelette, lying on a feather bed in the most airless corner of an airless room, crowded with adults, and opening only upon a court-yard in which the temperature is 90° F. in the shade; an infant whose restlessness and crying and thirst is soothed by the free administration of an artificial diet. He maintained that such an infant is under conditions peculiarly well fitted to produce the disturbance of body temperature which leads to a loss of all tolerance to food, and to ultimate intoxication from bacterial overgrowth and endogenous infection. To urge the overwrought mothers of such an infant to practise rigid cleanliness in the handling of the milk or to demand a low bacterial count of milk saprophytes per cubic millimetre in the milk were measures not in themselves sufficient.

Discussion.

Dr. E. H. T. NASH compared the summers of 1898, 1911, and 1921, all of them intensely hot. In 1898 and 1911 terrific epidemics of summer diarrhœa occurred, but this year although the heat and drought had been greater than ever, nothing like a serious outbreak had occurred. He maintained, therefore, that heat was not the most important factor. Was the change due to the introduction of dried milk?

Prof. T. E. HILL suggested that the change was due primarily to the education of the mother through the infant welfare movement, and partly also to the replacement of the privy system by the water-carriage system of drainage.

Dr. H. SCURFIELD said that Dr. Cameron's idea received support from the fact that mothers had now been taught to put their infants to sleep out of doors.

Dr. CAMERON, in reply, agreed that infant welfare work had been the most important factor in reducing infantile diarrhœa, but thought the result to have been achieved rather by educating mothers in rational clothing and other methods of combating the effects of heat than by the careful preparation of feeds.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The first evening meeting of the present session will be held in the Society's lecture theatre at 17, Bloomsbury-square, London, W.C., on Nov. 9th, 1921, at 8 P.M., when Prof. W. E. Dixon, F.R.S., will read a paper on the Drug Habit. Medical friends of members and student-associates will be welcomed.

YORK MEDICAL SOCIETY.—At the inaugural meeting of the session of the Society, held in the Tempest Anderson Hall at the Museum, York, on Oct. 19th, Prof. T. Wardrop Griffith delivered an address in which he discussed the future of the voluntary hospitals. The financial conditions affecting these institutions, the policy guiding the destinies of the Poor-law infirmaries, and the degree of intelligent generosity of the public of Yorkshire, made up, he said, an equation with as many unknown terms as there were considerations. If voluntary hospitals were taken over by the State or by municipal or Poor-law authorities, the cessation of private benevolence would necessitate increased taxation or rates; a hospital allotted to a stated area would lose its county reputation; the staff would cease to be honorary, and the question would arise of the comparative merits of full-time and part-time staffs. He was inclined to think that the service of part-time men—who were paid a moderate salary and were allowed to do private consulting practice—was the most likely form of service for hospitals of the future. He did not agree with Dr. Addison that the voluntary and municipal hospitals might go on for many years together; the former would be starved of pecuniary support and of suitable staffs as, unless he was greatly mistaken, was going to happen at Bradford. In conclusion, Prof. Griffith sketched his idea of the way in which the hospital system of the country might best be worked. In this system the present Poor-law infirmaries, with improved equipment, would be manned by a visiting staff of paid part-time officers, some of them young men fresh from the universities and medical schools, desirous of specialising or becoming consultants; whilst the voluntary hospitals, substantially subsidised by the State, would yet retain their freedom. An arrangement might be made by which those who benefited should pay, if they could afford it, for their maintenance in hospital, without loss of the truly voluntary character of the institution; in this way such patients would still be able to command the eager services of the best men in the profession.

Reviews and Notices of Books.

PATHOLOGY.

A Text-book of Special Pathology. Second edition. By J. MARTIN BEATTIE, M.A., M.D., Professor of Bacteriology, University of Liverpool: and W. E. CARNEGIE DICKSON, M.D., B.Sc., Director of the Pathological Department, Royal Hospital for Diseases of the Chest, London. London: William Heinemann. 1921. Pp. 591. 31*s.* 6*d.*

THIS is the companion volume to the authors' "Text-book of General Pathology" which was reviewed in THE LANCET of July 30th, but whereas in the first edition it had a separate existence, it is now quite definitely Part II., for the numbering of the pages and figures is carried on from the first volume. There has been little progress in morbid anatomy in the last few years, but the authors have revised their book and considerably enlarged it, and the opportunity has been taken to notice recent work on such subjects as heart-block, dysentery, and gastric ulcer. In other branches, however, the teaching is somewhat old-fashioned—the treatment of cirrhosis of the liver, hypernephroma, and myeloma leaves a good deal to be desired; while the chapters on Bright's disease and arterio-sclerosis are neither very clear nor very profound. A curious omission in a work of this magnitude and price is that of the description of the pathology of the female genital organs. It is undoubtedly true that this branch of the subject is dealt with in text-books of gynæcology; but it is also true that a certain amount of pathology is included in practically every general or special text-book on medicine or surgery. It is the province of the pathologist to consider disease processes from a different—possibly a broader—point of view than the physician or the surgeon, and this voluntary abdication of the position is scarcely to be commended. Several new illustrations, some very good, have been introduced, but on the whole the illustrations are not the most satisfactory feature of this work, which is for the rest admirably suited to the needs of the student.

General Pathology: An Introduction to the Study of Medicine. Being a Discussion of the Development and Nature of Processes of Disease. By HORST OERTEL, Strathcona Professor of Pathology and Director of the Pathological Museum and Laboratories of McGill University and of the Royal Victoria Hospital, Montreal, Canada. New York: Paul B. Hoeber. 1921. Pp. 357. 85.

THE author's aim in this book is to bring together in a concise and readable form the facts and considerations upon which modern pathology rests, and to treat pathological processes as expressions of physico-chemical laws, not in terms of the older conceptions of use, harm, defence, vital forces, conscious purposes, and so forth. Further, wherever possible he has attempted to present modern ideas in a rational manner by tracing their historical development, since, as he justly claims, the history of science, the bearing and influence which one step of thought exerts upon the next, is of real educational value. This is an ambitious programme and a difficult one to carry out in a book of some hundred thousand words. Unfortunately, the author's style is not suited to conditions which demand that one sentence shall do the work of three. He is compelled to resort to a liberal use of brackets—in one place no less than six occur in eight consecutive lines, and many adjectives; and there is nothing more inept than the ill-chosen adjective. What conception of the plasma cell, for example, is the student likely to get when he is told that it has "smooth, supple protoplasm"? And how likely is he to recognise an actinomycotic lesion on the strength of the information that "the centre exhibits the characteristic radiating, often club-shaped, filamentous convolutions"? Such descriptive lapses might have been mitigated by illustrations, but there are none. Nor do we think the author has discriminated wisely in the amount of space he has allotted to the various divisions of this subject. While one-third of the book is devoted to elementary bacteriology, other subjects are dealt with in the most superficial way, and what may be called functional pathology is scarcely mentioned.

If the general arrangement and presentation of the subject are open to criticism, so is the standard and even the accuracy of the teaching. The chapter on the pathogenic protozoa contains no reference to the Sarcodina, although it includes a subsection on the filterable viruses. But on page 47 we read "there exist a number of infective organisms in relation to dysentery, some of which are not even bacteria, but protozoa. Since the discovery of the ameba coli by Koch and Kartulis in Egypt, which was later confirmed by Osler, Councilman and Lafleur, and others, amebic dysentery has come to be recognised as a tropical disease." Such an error as this is unpardonable in any text-book, however elementary.

The chapter on immunity is interesting and the author has the courage to discard old shibboleths, but we are surprised to find that his researches lead him to the conclusion that blood for the Wassermann test must be drawn directly from vessels and never taken after a meal, during a fever, during any acute infectious disease, during suppurations, including ulcerating or necrosing tumours, and after narcosis. Surely this teaching is directly opposed to experience. The section dealing with the degenerations is adequate if not profound, and the same may be said for the treatment of inflammation. The section on tumours is not well done. The nomenclature employed is often unfortunate; it is quite unnecessary to call a fibrosarcoma a fibroma sarcomatodes, and the use of the word organoid to describe the epithelial neoplasm has nothing to recommend it; a carcinoma is a dreadful thing at any time, but it becomes unspeakably bad when it is described as an "undifferentiated, immature, uncoördinated, generalising organoid tumour." One of the most important fields of research in the pathology of human cancer is the separation of the blastomatoid processes from the true neoplasms, but this aspect of the subject is not touched upon; and in the subsection on metastasis, instead of the modern doctrines of permeation, we have vague generalisations about tissues of selection and the preparation of soils for metastases by inflammation and degeneration, "which occurs frequently in the neighbourhood of tumours, especially in the regional lymph glands into which tumour products drain concentrated products."

We can see no reason why Professor Oertel's book should supersede any of the text-books on general pathology now in use.

NEUROLOGY.

Traumatismes Cranio-Cérébraux. Accidents Primitifs, leurs Grands Syndromes. By H. DURET, ex-Chirurgien des Hôpitaux de Paris. Paris: Librairie Felix Alcan. 1921. In two volumes. Vol. II., Parts 1 and 2. Pp. 1356. Fr.150.

IN this monumental book the veteran Dr. Duret, whose initial work on a subject he has made peculiarly his own dates back more than 40 years, has tackled in comprehensive fashion injury to the head, and its sequelæ. The first volume (not now under review) dealt with cranial fractures; the second, divided into two sub-volumes of 1300 pages, is concerned with the rôle of the cerebro-spinal fluid as a compensating and regulating agent, and with commotio cerebralis, which is reviewed and re-examined from every standpoint. Here is a mine of information from which material of value will be extracted for many years to come.

In the great majority of cases of external violence to the head the force applied to the cranial cupola divides itself into two parts; one spends itself in vain against the solid resistance of the head coverings, the

other originates within the skull an active secondary force, universally known as commotion, which is transmitted in all directions by the incompressible cerebro-spinal fluid. Hence result all grades of traumatic lesion of the neuraxis, described by the author with profusion of detail, ranging from hæmorrhages and contusions to molecular disturbances. Some attention is paid to the curious cases of death, without obvious objective findings, consecutive to trauma, and the author is convinced that more minute investigation, especially of the medulla, would in such cases reveal adequate cellular or other modification. The volumes are well illustrated, personal and other cases are cited copiously, and while many of the bibliographical references date back to the latter half of last century recent work derived from war experiences is by no means ignored. It is somewhat tiring to the eye to encounter everywhere in the book a most prodigal use of italics and of capitals, and, as too commonly still the case with French scientific volumes, an index is wanting, for which lack a *table des matières* in no way compensates.

Leitfaden der Neurologischen Diagnostik. Eine Differentialdiagnose aus dem führenden Symptom für praktische Aerzte und Studierende. By Dr. KURT SINGER. Berlin and Vienna: Urban and Schwarzenberg. 1921. With 33 illustrations. Pp. 201.

DR. SINGER'S little guide to neurological diagnosis is based on the principle that for the general practitioner it is unnecessary to be able to differentiate between, say, Friedreich's disease and hereditary cerebellar ataxia, whereas he ought to be in a position, recognising the main symptoms of nervous cases, to determine their localising or diagnostic import. Rigorous exclusion of non-essentials has enabled the author to produce a book suitable for the needs of the busy practising physician arranged under such headings as paralysis, amyotrophy, disorders of sensibility, gait, twitching, cramps or fits, tremors, neuralgia, headache, giddiness, &c. Only a sound and wide knowledge on the author's part has enabled him to pack so much information into so little space. The book appears well calculated to fulfil its mission.

THE DIRECTION OF HUMAN EVOLUTION.

By E. G. CONKLIN, Professor of Biology in Princeton University. London: Humphrey Milford. 1921. Pp. 247. 12*s.* 6*d.*

THE lectures which go to form this interesting volume were given under the John Calvin McNair lectureship in the University of North Carolina "on the mutual bearings of science and religion upon each other." In the first part, on the paths and possibilities of human evolution, the author examines the past history of man for indications of his future. He concludes that there is no probability that a higher animal than man will ever appear on the earth and that man has reached the limit of his possible physical and intellectual development. Social development is the only path left open for him, and just as evolution has progressed from the individual to the family, the tribe, and the modern State, so some day it will bring the whole human race together into a federation of the world.

The argument rests on many disputable statements; the intellectual, as distinct from the æsthetic, superiority of the Athenians over the moderns may well be questioned, as may the statement that the "great increase in nervous and mental disorders" indicates that "the evolution of the brain and nervous system of man has practically reached its limit." Hardly adequate credit seems to be given to Samuel Butler for his illuminating idea of "detachable limbs," nor to Benjamin Kidd for his "Social Evolution" and "Science of Power." The great goal towards which the human race is moving being the rational organisation of society, the author next turns to the question as to whether democracy will serve this purpose. This section of the book is chiefly of interest for its demonstration of how far the Americans are at present from appreciating what democracy is about. It is commonly thought, says Prof. Conklin, to involve the idea of maximal individual freedom and minimal social control; freedom is exalted above service, and "Liberty" is stamped on the coins with pictures of an Indian and a buffalo to show what it means. This, he points out, is a very primitive state of mind and recalls, from Huxley, that each bee has its duties and no bee has its rights; what is wanted is social coöperation rather than class antagonism, reason instead of passion, humanity in place of nationalism. Noteworthy is the expression of the conviction that the further progress of humanity will necessarily involve the breaking down of the segregation of white and coloured races. Man is a wild animal and there is no one to domesticate him; he combats and overcomes the cosmic processes that dominate other animals; pure lines and selected breeds are therefore impossible. Democracy, with all its faults and difficulties, is the only route for further evolution. There is in this section of the book so much that is opinion rather than fact that criticism in brief is hardly possible. But it is not clear that the author has realised that democracy is a means, a mode of freedom, not an end in itself. The final third of the book deals with evolution and religion, and here the author becomes obscure and difficult to follow beyond his obvious thesis that there is nothing incompatible between natural knowledge, evolution, and religion. Prof. Conklin is a rationalist and he finds the usual difficulties in applying his intelligence to an analysis of his relation to God. Sundar Singh remarks that milk does you more good if you drink it than if you analyse it, and advises you to take religion in the same way; Bosanquet says much the same. But Prof. Conklin's gospel is that you get more real benefit from analysis, and he proceeds to consider how that is to be done in a series of chapters which are interesting but not very illuminating.

The book as a whole can be warmly recommended to those who are curious about the relation of mankind to the world; it is suggestive and provocative, an effect enhanced by the jerky style and ejaculatory method of presentation; it would do splendidly for reading aloud in a small circle for discussion. Some possibilities are not discussed and it would be interesting to hear the author's views on the likelihood that the route for further human progress, which he can see only in social coöperation, is along lines which, in our present terminology, we should call spiritual; the path at any rate is probably not an altogether obvious and intelligible one, else we should be on it already. Laying, as he does, so much stress on the lessons about the course of evolution which we can collect from its past history, it is surprising that he does not deal more fully with the chance that mankind is "destined" to suffer the fate that is known to have overtaken so many large and highly-specialised vertebrates and be completely obliterated. Perhaps his cheery and stimulating optimism deflected him into more encouraging topics.

CEREBRO-SPINAL FLUID.

Líquido céfalo-raquidiano. Its Clinical Value Estimated from Observations in the Laboratory of Prof. Alberto de Aguiar. By Prof. ALFREDO DA ROCHA PEREIRA, of the Faculty of Medicine of Oporto. Oporto: Companhia Portuguesa Editora. 1921. Pp. 336.

THIS work is divided into five parts and a bibliography. The first part, describing the normal cerebro-spinal fluid, its anatomical and physiological characters, and its composition, calls for no particular comment. In the second part the variations from the normal are dealt with, the aspect and colour, tension, the presence of albumin. Froin's syndrome (massive coagulation and xanthochromia), albumino-cytological dissociation, Noguchi's reaction, and the presence of urea, chlorides, and glucose. Chapters are also

devoted to the leucocytic formula, biological investigation and bacteriological and parasitic examination, while the concluding chapter of this part of the book deals with the most recent methods of research such as Lange's colloidal gold reaction, elaborated by Miller and Levy and by Lowrey, Smith's mastic reaction, Szeci's oxidase reaction, and the Weil-Kafka hæmolysin test.

The third and fourth parts of the work consist of details of 177 cases, comprising 206 analyses. Those dealt with are syphilis, tabes, general paralysis, tuberculous meningitis, non-tuberculous meningitis, meningismus, exanthemic typhus, meningeal hæmorrhage, hemiplegia, myelitis, polyneuritis, cerebral tumour, various other organic nerve lesions, neurosis, various diseases other than those of the nervous system, and Bright's disease. The fifth part is a description of the technique employed by the author in carrying out the various investigations. The most noteworthy points in his conclusions may be summed up as follows: The average quantity of urea was 0·2 against 0·06 calculated by Mestrezat: Noguchi's reaction when negative excludes syphilis, when positive gives an indication in favour of syphilis if the amount of albumin is normal or only slightly raised; the existence of meningitis without cellular reaction is not admitted, unless in exceptional cases of localised meningitis, a conclusion contrary to the views of various observers, among them being Anglada and Mestrezat; leucocytosis is much more frequent than is supposed, even in atypical affections of the central nervous system. During generalised syphilis, even before secondary symptoms have arisen, modifications in the fluid were frequently met with, especially excess of albumin, lymphocytosis, and even a positive Wassermann, and syphilitic epilepsy was more common than is supposed. It was found that the W.R. was always positive in general paralysis; also that a marked lowering of the percentage of chlorides was an almost certain indication of tuberculous meningitis.

The work is completed by an extensive bibliography, in which we note the names of Graham Forbes, Lowrey, Miller and Levy, and Louis Weed. A systematic treatise on the cerebro-spinal fluid such as this supplies a want and constitutes a valuable text-book of reference both for the clinician and the pathologist. Prof. Pereira's book is a monument of arduous work and intelligent research summarised in a useful and complete form.

LABORATORIES: THEIR PLANNING AND FITTINGS. By A. E. MUNBY. London: G. Bell and Sons. 1921. Pp. 220. 25*s*.

THE excellence of the work done in laboratories depends a great deal more on the people who use them than on the building and fitments. But it is no doubt easier to do good work in convenient and well-equipped institutes than in such places as Claude Bernard had, and it is not invariably true that the building of a new laboratory is the last work of every fertile investigator to whose duties this exacting task is added. Anyone who has to undertake the job will find many useful hints in Mr. Munby's book; anyone who has actually done it will find some points of disagreement and some of omission. The design and especially the internal arrangement of laboratories naturally reflect the individuality which is characteristic of laboratory workers, and no one could think of standardised laboratories without having visions of standardised brains. On some general points, however, advice is very useful, especially to those who may not have had much opportunity of seeing a diversity of institutions.

The book is arranged in the main under subjects—physics, chemistry, and biology with a specially good chapter on "laboratory services"—and this is perhaps rather an objection, since it obscures the sound principle that laboratories should be capable of being used for almost any purpose. What is wanted, shortly, is a good firm building, the shell of which will stand by itself, with the internal divisions on each floor constructed in such a way that they can be easily remodelled for changing requirements; as many windows and as large as can be secured; abundance of gas, water, electric current and drains, with adequate arrangements for heating and fume cupboards; standardised blocks of drawers and cupboards on which bench tops can be arranged as required. These are the essentials which require attention before the building is begun; and on this foundation almost any sort of specialised work can be accommodated. There are 165 useful plans and pictures and an interesting historical introduction on early laboratories by Sir Arthur Shipley.

CHEMISTRY.

Introduction to Qualitative Analysis. By TH. WILHELM FRESENIUS. Seventeenth edition of the original work by C. R. FRESENIUS. Translated by C. A. MITCHELL, M.A., F.I.C. London: J. and A. Churchill. 1921. Pp. 954. 36*s*.

THE original German edition of this standard work appeared as far back as 1840 and the present volume has been remodelled to make it conform with the modern conceptions of chemistry. Part I. is concerned with the general principles and methods of analytical chemistry and Part II. with a systematic course of qualitative chemical analysis. The author rightly insists that to conduct qualitative investigations it is necessary to have a knowledge of the chemical elements and their most important compounds, and also of the fundamental laws of chemistry, whilst practice in the visualisation of chemical processes is also essential. If to manipulative skill is added the practice "when results contrary to experience are obtained of looking for an error in the experiment itself, or rather in the absence of a condition necessary for the production of the phenomenon, since this habit must be based on a firm belief in the unsuitability of the laws of nature, then all the conditions necessary for a fruitful study of analytical chemistry are present." These words are worth the quoting since they express the ideals of a great master of analytical chemistry.

The portion of the work dealing with the examination of natural waters and the detection of poisonous elements is well up to date and will enhance the value of this recognised standard work to the medical profession. Mr. Mitchell has carried out a difficult task well, and it is obvious that the greatest care has been taken in the rearrangement and translation.

Dictionary of Applied Chemistry. Vol. II. By Sir EDWARD THORPE, C.B., LL.D., F.R.S. London: Longmans, Green and Co. 1921. Pp. 717. 60*s*.

VOL. II. of this important work, which starts with "Calculi" and ends with "Explosion," follows with commendable rapidity on Vol. I. Many of the articles will be read with great interest by medical men. The section on carbohydrates, contributed by Dr. E. F. Armstrong, F.R.S., is an admirable survey of the properties and occurrence of these important compounds. Under the heading of dextrin it is stated that maltodextrin $6(C_6H_{10}O_5)H_2O$ is the only dextrin which has been prepared in anything like a state of purity; we may point out that Mr. J. L. Baker in 1902 described the preparation and properties of α-amylodextrin which is quite a well-defined compound. The section on cellulose is written by the well-known authority, Mr. C. F. Cross, F.R.S., and is worth reading by those who are interested in this subject. The manufacture and properties of chloroform are described by Dr. A. J. Ewins, who points out the need of especial care in the manufacture of chloroform for anæsthetic purposes. The presence of small amounts of impurities has a deleterious and often dangerous influence, and many cases of death under chloroform have been attributed to the employment of impure anæsthetic. The effect of alcohol as a preservative of ch'oroform is

discussed and a list of tests is given for the presence of impurities other than alcohol, which the pharmacopœias usually insist on. A lengthy and interesting article on alkaloids is written by Mr. B. F. Howard and Mr. O. Chick. The history and cultivation of cinchona, and the many alkaloids found in the barks are described. The quinine market is a curious one and, considering the extent to which this drug is used in the British Empire, it seems remarkable that we cannot make all the quinine we require by undertaking the scientific cultivation of cinchona in our colonies, instead of being subject to the control of Dutch merchants. Contributions on camphor, cocoa, coffee, cheese, and particularly on disinfectants, will repay perusal. Throughout the volume few errors are noticeable; the writing is clear and the editing admirable.

AUTOBIOGRAPHY OF AN ANDROGYNE.

New York: The Medico-Legal Journal. 1918. Pp. 265. 8s.

THIS is the auto-biographical story of a life-long struggle between devoutly religious ideas and intensely perverse desires. The book is not for general reading, but whoever is called upon to deal with disorders of impulse and conduct—whether he be doctor, lawyer, or legislator—will act with fuller justice if he has such knowledge as a book of this nature can give him.

A MANUAL OF PHARMACOLOGY.

Fifth edition. By WALTER E. DIXON, M.D., F.R.S., Reader in Pharmacology, Cambridge University. London: Edward Arnold and Co. 1921. Pp. 468.

THE new edition of Dr. Dixon's Manual of Pharmacology has nothing to fear from critics. The strength of the book is the common-sense way in which the author, who knows all there is to be known on the subject of pharmacology, limits what he imparts to the useful and applicable side of the drugs. He gives the information which counts. The non-therapeutic drugs receive their due without being over-emphasised. The book does not aim at any theory in arrangement and is essentially practical; thus many-sided drugs like the atropine group and sulphur do not break down any high-aiming scheme. Dr. Dixon has by his pharmacological work been in part responsible for the recent revival of the application of physiology to medicine, which implies also a revival of pharmacology. This book is the summary of his own and others' work which has made this revival possible. It is a manual of pharmacology which does not encroach on therapeutics. If students could be persuaded to learn scientifically, considering the actions of drugs in the manner laid down in the early pages of the book, learning would be easy; instances given there make the rest of the book simple reading. The tracings and formulæ, which at first sight suggest that the book may be technical and tedious, are found on nearer examination to add materially to the interest of the text. We note that Dr. Dixon assents to, but is not an enthusiastic adherent of, the myoneural junction theory, and that he considers that alkalies taken before food do inhibit the secretion of gastric juice; recent work would hardly seem to support this view. As regards minor details of accuracy the book is excellent.

The fifth edition is well up-to-date and is not hampered by old formulæ and out-of-date drugs. It is, we believe, the best book of its class on pharmacology.

JOURNALS.

HEALTH: JOURNAL OF THE FEDERATION OF MEDICAL AND ALLIED SOCIETIES, 12, Stratford-place, London, W. 3*d*.—The journal of the Federation of Medical and Allied Societies has made its appearance this week, and states concisely on the title page its object. It is "concerned in assisting the formation of opinion on public health questions." In a lucid foreword by Sir Malcolm Morris this idea is further explained: "It is not enough," writes Sir Malcolm Morris, "that the leaders of the societies should meet in conference as they are doing. If this great combination is to pull its full weight, it must be sustained by an instructed and vigorous public opinion in the membership. The rank and file, numbering scores of thousands, must be brought into the debate. They must be kept informed of what is afoot, they must have opportunities of adding their knowledge and wisdom to the common stock. That is why *Health* has been started." The contents of the new journal, modest though it is in size and price, fairly live up to a large promise. A statement of the position under which an inquiry into the working of the Insurance Act is being sought for is followed by an excellent special article on the voluntary hospitals and the national provident scheme, by Dr. Gordon Dill. The *revue* of the week takes particular notice of the public interests in such questions as grants towards milk for necessitous mothers, the payment for insurance under the Unemployment Insurance Act by nurses, and the exemption of nurses and midwives from juries, now that women can take their place in the box. A thoughtful article by Dr. Jane Walker upon the question of whether marriage should be regarded as a bar to the employment of women deals with a matter of topical urgency. The diary of the proceedings at the meetings of societies and associations where these and similar subjects are discussed forms a useful section of the paper, and one which is probably intended to become a regular feature. We wish our contemporary all prosperity.

ANNALES DE L'INSTITUT PASTEUR.—In Vol. XXXV., No. 8 (August, 1921), Gengou has taken up the study of the substances causing breaking up of bacteria within the leucocyte, and by extracting with acids and neutralising the product obtains a substance capable of producing a similar result in vitro. Since the morphological changes undergone by the bacteria under these circumstances are the same as those occurring within the leucocyte in vivo he considers that his extracts contain the active substance of the leucocytes. Other tissues fail to give similar extracts. The extracts are only active within a moderate range of alkalinity or acidity on either side of neutrality. The extracts contain a single substance capable of acting on a variety of organisms, not specific substances for different organisms. The active substance is protein in nature or closely bound up with the proteins of the extract. They exert no hæmolytic action on red blood corpuscles, and cannot be made to do so by the addition of either fragment of the complement from which, and from other considerations, Gengou considers this substance distinct from complement, and, although capable of digesting gelatin, also distinct from the proteolytic ferments of the leucocytes.—The Mechanism of Action of Hirudin and the Antithrombin of the Plasma obtained after an Injection of Peptone, is the subject of a long paper by André Gratia. The author accepts the classical theory of coagulation, as enunciated by Bordet and Delange, which assumes the presence of three substances essential for coagulation: a thermolabile humoral substance (serozyme), a thermo-stable cellular product (cytozyme), and fibrinogen. He accepts the lipoidal nature of the cytozyme and habitually uses a lipoidal extract as cytozyme in his experiments. In general the antithrombin of peptone-plasma and that of hirudin have similar properties: he does not agree with Mellanby and others that the former, like that set free in anaphylactic shock, is merely an increased alkalinity of the blood, but considers it a specific substance. Both these antithrombic substances have the property of being effective in much smaller doses the earlier they are made to intervene in the process of clotting; a quantity capable of inhibiting the combination of serozyme and cytozyme to form thrombin being insufficient, at a later stage, to neutralise the thrombin when once this is formed. The amount of hirudin required

to prevent clotting is a function of the amount of thrombin present, and the quantity required to prevent the serozyme-cytozyme combination is proportionate to the relative concentrations of these two substances in any given experiment. The author also considers that hirudin can exert an influence at a yet earlier stage, and inhibit the transformation of proserozyme into serozyme. Thrombin and antithrombin form an inert complex, the antithrombin being neutralised but not destroyed; heating will destroy the thrombin and set free the antithrombin again. The paper finishes with a quite interesting comparison between the action of thrombin and antithrombin in the presence of fibrinogen, and of toxin and antitoxin in the presence of the cell.—This number also contains a short paper by H. Limousin on the direct cultivation of *B. tuberculosis* from the sputum on Pétrof's medium, which has given the author satisfactory results.

Reports and Analytical Records

"VALEDA" INVALID FOOD AND "GOOD AS GOLD" BABY FOOD.

(AUSTEN FOODS, LTD., BATH.)

THESE two foods when analysed gave the following results:—

	"Valeda" per cent.	"Good as Gold" per cent.
Carbohydrates, starch, &c. ..	78·0	75·6
Fibre	0·6	0·5
Protein	12·1	11·1
Fat	1·5	1·4
Mineral matter	0·9	0·8
Moisture	6·8	10·6
	99·9	100·0
Matters soluble in cold water	6·3	5·8
Alkalinity (as $NaHCO_3$) ..	0·17	0·17
Starch liquefying enzyme ..	absent	absent
Nature of starch	wheat	wheat

These figures are characteristic of "heated flour" preparations. Nothing can be said against "Valeda" as an invalid food. With regard, however, to the infant's food, the words of Dr. F. J. H. Coutts in his report to the Local Government Board[1] may be quoted:

"I am of opinion that foods containing unchanged starch or starch altered only by heating should not be given to babies under 7 months of age, except on the advice of, and under the supervision of, a medical man."

"ASEPSO" SOAP.

(MESSRS. EDWARD COOK AND CO., LTD., BOW, LONDON.)

This soap is stated to be a remedy for eczema, ringworm, and other skin troubles. When analysed it was found to contain 2·8 per cent. of mercuric iodide (HgI_2), which confirms the manufacturers' claim of 3 per cent. of this ingredient. The germicidal value of mercuric iodide is well known, and it is obvious that this soap, used with discretion, should be of considerable value to the medical practitioner.

LYND'S "WELL-MADE" SOAP.

(WM. LYND AND CO., BOWMAN-LANE SOAP WORKS, LEEDS.)

We have received a sample of soap of the "Well-made" brand for examination. Our analysis showed the following percentage composition:—

Water	27·07 per cent.
Fatty anhydrides	64·48 ,,
Free alkali as NaOH	0·64 ,,
Alkali (Na_2O) combined as sodium carbonate	0·64 ,,
Alkali (Na_2O) combined as soap..	6·87 ,,
Insoluble matter	0·10 ,,
Resin acids	present.

This soap is of good quality and suited for domestic purposes. The amount of free alkali and insoluble matter is negligible.

[1] 1914, New Series, 80, p. 31; see also THE LANCET, 1914, ii., 512.

VERMOUTH, FRATELLI CORELLI, TORINO.

(EDWARD YOUNG AND CO., LTD., 62–3, MARK-LANE, LONDON, E.C. 3.)

On analysis this vermouth was found to have the following composition:—

Alcohol (by weight)	11·31 per cent.
Fixed acidity (as tartaric).. ..	0·36 ,,
Volatile acidity (as acetic)	0·06 ,,
Extract	15·26 ,,
Total sugars	14·70 ,,
Specific gravity	1041·72°

This vermouth consists of a matured wine to which has been added certain vegetable extracts, mostly derived from the cinchona family. The analytical results quoted above are typical of a good vermouth. Skilful blending of the flavouring matters has resulted in a very palatable product, which is free from "harshness" or excessive sweetness.

WILBERT'S INVALID PORT.

(WILLIAMS, HUMBERT, AND CO., 38, MINCING-LANE, E.C.)

When drawn from bond and analysed this wine was found to have the composition:—

Alcohol	21·3	per cent. (by volume)
equivalent to	37·3	,, proof spirit.
Total extractives	9·4	,,
Containing—Mineral matters	0·2	,,
,, sugars ..	8·5	,,
Total acidity (tartaric) ..	0·33	,,
Volatile acidity (acetic) ..	0·03	,,

The sugars consist of a mixture of dextrose and lævulose, cane sugar being absent. The analytical results confirm the statement of the vendors that this is a straight Douro port wine containing no admixtures.

New Inventions.

A NEW BLADDER LAMP.

THE method commonly in use for the artificial illumination of the interior of the bladder during an open operation is to reflect electric light from either a hand- or head-lamp through the opening made in the anterior abdominal wall. Both these lamps are inconvenient to use and unsatisfactory in their results. Recently I have devised an electric lamp which can be fitted to the posterior blade of Thomson Walker's bladder retractor. It completely illuminates the base of the bladder, the lateral walls, and the internal meatus. The metal blade of the retractor acts as the reflector. The accompanying illustration shows how the lamp is attached to this blade, and is situated wholly inside the bladder. Owing to its simple design it takes up no appreciable space within the vesical cavity. Should the lamp become covered with blood during an operation a gauze swab on forceps will efficiently clean it. The lamp with its attachment can be sterilised by insertion in methylated spirit or 1 in 40 carbolic acid. During the operation the cable lies beneath a sterilised towel and does not come in contact with any instrument.

The lamp can be obtained from the Genito-Urinary Manufacturing Company, to whom I desire to express my thanks for much valuable help in its design.

Welbeck-st., W. CLIFFORD MORSON, O.B.E., F.R.C.S.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 5, 1921.

Of Clinical Units.

THE clinical units, which have been established for some two years at several of the London and provincial general hospitals, mark a new era in the attempt to solve the problems of medical education, and at the same time they indicate an effort to promote the scientific study of medicine. It is too soon as yet to assess the progress made, but it is not too soon to attempt an estimate of their chances of success or failure. The formation of these units has evolved from the desire to explore old ground by new methods, as Sir CHARTERS SYMONDS recently said of the Hunterian era, and their establishment marks the close of a system of professional education which, until quite recently, had been a private enterprise. In no other country than our own could a complete system of medical education have been maintained continuously by private effort, and there are some, no doubt, who will deplore the modification of a system that has attained so large a measure of success. Reform is welcomed in the face of failure, but in the face of great results it requires close justification. Though the time is not ripe to pass judgment on the unit system, its existence is beginning to awaken general interest and its sphere of activity to take a more concrete form; as recent communications to THE LANCET have shown, informed opinion is crystallising as to the more immediate aims that the clinical units should keep in view. Elsewhere in this issue there appears an article by Sir CLIFFORD ALLBUTT, which, though it claims only to be a comment on an article on clinical units by Dr. C. M. WILSON, of St Mary's Hospital, is in itself an inspiration to all who have the interest of medical education at heart.

If the new clinics could attract visitors from foreign cities to British medical schools they would at once be missions with a more than medical significance. In pre-war days the German and Austrian medical schools were centres for the dissemination of continental thought, and with every year that passes we can, as a nation and as a profession, less afford the island isolation that was once our boast. In the more immediate field of work Sir CLIFFORD ALLBUTT counters an implied objection to the unit system, an objection based on the assumption that the teaching of professors of medicine—that is, of men who do not practise medicine in the ordinary sense—will be theoretical rather than practical, and that these attitudes of mind must be poles apart. When science was in its infancy its votaries were often abstract thinkers, but with the development of controlled experiment a new type of scientist has been born. He is a man with vision and imagination, who pursues his goal undeterred by side-issues and undismayed by failure; at the same time he is a man of fact and practical ability, using dispassionate observation and experiment as his working tools. Such men are a composite in themselves of what is practical and theoretical. Convincing proof of this was furnished in the war when the nation applied to the purest scientists for practical help and physicists and chemists turned their energy to the manufacture of engines of destruction, and biochemists laid down the principles that determined the rationing of our armies in the field and the civilian population at home. In the matter of teaching Sir CLIFFORD ALLBUTT looks to the units to take their share in the pioneer work of advanced teaching, but if they follow the lead of the great universities, in which their members have been trained, their directors will take a share in undergraduate teaching. It is well known that principles are more difficult to inculcate than details, and that advanced teaching is a simple matter for anyone who has made an intensive study of the subject he is called upon to teach. In our older universities it is the practice for the elementary courses of instruction to be given by the professors, while the more advanced lectures are given by lecturers and assistants, and by the professor himself only in that particular subject in which he has a special knowledge.

Those who are responsible for medical education, and especially those who are interested in the success of the clinical units, will guide the workers in these units in balancing the somewhat conflicting demands which are made on them by the duty owed to the patients under their care, which must necessarily come first; by teaching, whether graduate or undergraduate; and by research, without which any teaching must lose its inspiration. With the small staffs of which these units are at present composed these demands may become insistent and deprive the workers of the leisure required for the assimilation of new knowledge and for research. Though the personnel of the units may be spared the care and strain of private practice, the units in bulk must be on their guard against the temptation of striving to arrive at maturity too soon. They have a difficult path to tread before they can achieve full success. The enthusiasm and vigour that is part of a new life or a new idea will not be lacking, but diligent consistency in following defined aims will best attain the end in view.

Observations on Epilepsy.

THE presidential address delivered by Mr. PERCY SARGENT before the Section of Neurology of the Royal Society of Medicine bears on certain as yet unsolved problems connected with epilepsy, and is the more welcome in that it is written from the viewpoint of the neurological surgeon. Sharing, apparently, the recently expressed opinion of Dr. JAMES TAYLOR that the attempt to enmesh epilepsy in the net of psycho-analysis represents a definitely retrograde movement, Mr. SARGENT devotes himself to a discussion of the pathogenesis of convulsive seizures, and in this connexion admits that he has been impressed by the striking rapidity with which visible circulatory changes occur in the exposed cerebral cortex in response to various disturbing causes. The vascular theory, as it may be called, of spasmogenesis was sustained and illustrated by Dr. A. E. RUSSELL in his Goulstonian lectures of 1909, and it is examined afresh by Mr. SARGENT with the aid of personal observations. His suggestion is that the tonic stage of an epileptic attack is the sequel to sudden and transient disorder of the cortical circulation, resulting immediately in a "decerebration" such as has been recently the subject of clinical study in man, while clonic movements may conceivably be the expression of returning circulation. Mr. SARGENT cites a personal experience from the laboratory of Prof. C. S. SHERRINGTON, when the pia mater was seen to blanch during the application to the cortex of a faradic stimulus of sufficient strength to evoke epileptiform movements. This observation is not, of course, new, and yet the phenomenon may not have received the attention it merits.

An interesting article[1] was published by Mr. LERICHE

[1] Presse médicale, 1920, xxviii., 645.

last year, bearing on the pathological physiology of Jacksonian epilepsy following gunshot wounds of the head. MR. LERICHE took the occasion to examine his patients in the seated and not the recumbent position, the tension of the cerebro-spinal fluid being very different, according to him, when the subject is seated, and when a local and not a general anæsthetic is employed. In these circumstances he has observed on several occasions that the onset of a Jacksonian fit is immediately preceded by an arrest of cerebral pulsation and by instantaneous blanching of the cerebral pial vessels at the same moment; and he has made the further observation, in similar experimental circumstances, that in a large number of Jacksonian cases the tension is below rather than above the normal. Such observations, coupled with those made by MR. SARGENT, seem to warrant closer investigation with wider material, for their bearing on the pathogenesis of epilepsy is at once apparent. MR. SARGENT is led, from a consideration of his great, if not indeed unique, experience of gunshot head wounds in connexion with epileptiform attacks, to suggest that one of the most frequent causes of local circulatory disturbance, and so, ex hypothesi, of convulsions, depends on the fixation of the brain at the point of damage to the overlying membranes and scalp; it is occasioned by the cerebral movements. It is true, no doubt, that but a small proportion of patients with "anchored brains" develop epilepsy, and the fact suggests the question of a possible constitutional factor and of neuropathic inheritance. MR. SARGENT sees in a "low degree of stability of the nervous tissue" that undefined something from the necessity of postulating which the student of epilepsy cannot apparently escape. Here we find ourselves in the region of the imponderabilia once more, and it is precisely here that the door is left open for the intrusion of speculation if not of fantasy.

We shall welcome the result promised of MR. SARGENT'S operations on some 120 patients suffering from epilepsy following on gunshot wounds of the head, and the communication will, we feel sure, be enhanced in value by the inclusion of information as to the individual constitutional inheritance of the patients operated on. If only some 5 per cent. of patients with head injury sustained in warfare develop subsequent epilepsy, and if they do not all show some definite traumatic cranial defect, then clearly trauma alone is inadequate to cause convulsions, and the necessity of authoritative investigation of individual antecedents is more than ever patent. As for the group of idiopathic epilepsies, MR. SARGENT declares that at the present time surgery has nothing to offer by way of treatment; in any case he deprecates recourse to surgical interference if medicinal and other therapeutic measures cannot be prosecuted at the same time over a long period.

Epidemic Situation in Soviet Russia.

THE new Health Committee of the League of Nations, which met in Paris on Oct. 20th to 23rd, received an important communication on the present epidemic situation in Russia from Dr. NORMAN WHITE and Dr. L. RAJCHMAN, who have just returned from a visit to Moscow in their capacity as members of the Epidemic Commission of the League of Nations. It had been decided that the work which this Commission has accomplished in dealing with the risks of spread of epidemic diseases from Russia to the States which border that country on the west should as far as practicable be supplemented by inquiries in Soviet Russia itself, and the Commissioners have already succeeded in obtaining much valuable information as the result of their visit, a report of which is promised at an early date.

In view of the persistent reports of outbreaks of plague during recent years it is interesting to learn that in European Russia not a single case of plague has been officially verified. Cases have been reported but immediate bacteriological inquiry has in each case negatived the diagnosis. There was, however, a real outbreak in Batum, where prompt recourse was had to anti-plague vaccination on a considerable scale. The outbreak of cholera which has been so severe in the regions of Russia affected by scarcity and famine in the summer months of the present year is reported now to have come to an end very abruptly and unexpectedly; no adequate explanation is, however, so far forthcoming for this rapid cessation. As regards typhus, official notifications aggregate more than two million cases in 1919 and nearly three million in 1920. It is acknowledged by the Russian authorities that these figures very much understate the gravity of the outbreaks. It is estimated that if the Caucasus, Siberia, the Ukraine, and other parts of Russia for which no figures are available, be included, the number of typhus cases in these two years would approximate to 20 millions. Epidemic typhus has been less severe during the present year, but it is difficult to forecast the severity of the outbreak to be expected in the coming winter season, and it is noteworthy that this disease is already again prevalent in the areas afflicted by scarcity and famine. During 1921 relapsing fever has been more prevalent even than typhus; a similar state of affairs has been reported from contiguous parts of Poland. It has caused much sickness, but, as usual with this disease, very little mortality. At the present time enteric fever is very widespread and is causing considerable anxiety to the Russian public health authorities. Dysentery has not been very serious, though a very severe outbreak was experienced in Petrograd in 1920, when the mortality rates were very high. Small-pox is widespread but is not considered to present a very serious problem; vaccination has been very extensively carried out in the affected areas. Malaria has been extremely severe in the Volga districts; while a considerable outbreak of malaria was reported this summer as far north as Archangel.

Venereal Clinics and their Clients.

AT a conference of the Western District Branches of the National Council for Combating Venereal Diseases, held recently at Bristol, one of the main topics of discussion was the difficulty of securing the attendance of patients at treatment centres until they have been rendered non-infective. Medical officers of health, not for the first time, raised this question and insisted on its importance. A summary of the reports of the London County Council on venereal diseases, for which Dr. F. N. K. MENZIES and Colonel L. W. HARRISON were responsible, has dealt with the matter,[1] as did proposals made by a subcommittee of the Liverpool City Council, which were included in the annual report for 1920 on the health of Liverpool by Dr. E. W. HOPE. There is, in fact, a consensus of informed opinion as to the existence of the loss of efficiency involved by this discontinuance of treatment, and as to the desirability of dealing with it. But although the situation is beyond dispute it may be difficult to secure unanimity between Parliament, the medical profession, and the public as to the best course to be

[1] THE LANCET, August 20th, 1921, p. 408.

adopted. The treatment of venereal disease at clinics has been instituted that the sufferings of individuals infected may be alleviated without expense to themselves, and also that so far as persons presenting themselves for treatment are concerned, the infection of others by them may be averted and the transmission of venereal disease by infected persons, including parents, checked. The cure of the patient is not the main end aimed at but one of the means by which a measure of prevention may be attained. Universal treatment of all persons suffering from venereal diseases is out of the question, at present at all events, but two objects have to be kept in view in striving towards that ideal. These are the attracting for treatment of as many patients as possible and the effective arrest of the disease so far as they are concerned. The former is largely a matter of rendering all the circumstances of treatment at a clinic as little repellent to infected persons as possible, and of inducing them to seek it by diffusing the knowledge that everything possible will be done to relieve them, provided that they will do their share conscientiously. According to estimates made by those qualified to judge, the persons who do not persevere until there is no fear of their infecting others constitute not less than 30 per cent. of the number treated, and may in some localities amount to 60 per cent., so that to this large extent the clinics fail in fulfilling their mission. Dr. R. E. ROBERTS gave one such estimate in our own columns (August 6th, p. 277).

As causes of this defect, lack of better conditions for treatment, and failure to attract patients no doubt play their part. There remain also to be taken into account the careless recklessness of the uneducated patient, the optimism which mistakes the relief of the more distressing symptoms for a completed cure; the difficulty of explaining absence from work or from home in attending the clinic; and the call of various occupations, such as those of the seaman or commercial traveller—the list is not exhaustive. The London County Council report deals in detail with the conditions desirable in clinics, and with the other causes of interrupted treatment. At the meeting at Bristol it was suggested that some form of administrative procedure might be instituted which would induce, if it did not compel, attendance to the point at which no further danger of the infection of others is possible. Legislation to compel persons suffering from venereal diseases to seek early and adequate medical attention seems to us to be out of the question—those who talk glibly of such measures are not living in a world of facts. There is, however, plenty of evidence that the offering of free treatment to those who may seek it voluntarily is so far appreciated that many clinics suffer rather from congestion and from the difficulty of dealing with the flow of patients than from the lack of them. The L.C.C. report plainly suggests that overcrowding, long periods of waiting, and inadequate opportunity for attention during examination contribute to promote the lapses in perseverance. There is, therefore, a considerable number of persons to be treated, although all may not offer themselves, while legislation to compel the public to do more than they do already appears not to be practicable. Anyhow, the time is not ripe for such procedure, but it may be possible to effect considerable improvement without it. The example of other countries affords us some guide. Without the exercise of such compulsion there remains the power of persuasion, instruction, and advice, exercisable already where there is time and the necessary personnel to apply it. There is, further, the practicable course, if it were to be introduced, of following up cases from the clinic to the home, whenever the patient, still capable of spreading infection, appears to have discontinued treatment. The officer from the central office, or the clinic, the almoner or the health visitor would seek out the man or woman and endeavour by persuasion and personal influence to bring him or her back to the clinic. The objection would, no doubt, be made to such a proposal, that the promised and advertised secrecy of the clinic's treatment would in such cases be liable to be sacrificed, and the efficacy of the whole scheme impaired by a deterring influence thus aroused. It is, however, open to question, as some who have had practical experience maintain, whether the persons seeking treatment for venereal diseases at clinics, or at any rate the men so situated, attach quite so much importance to the concealment of their condition as many believe. Men and women of mature age and of a different social standing from the young people affected may overrate the value of secrecy.

But even if the dread of disclosure exists to the full extent imagined, it might conceivably be made to play a useful part in inducing perseverance in attendance at the clinic. If the patient were warned at the outset that the treatment sought would be given only on the condition that he must persevere to the end, he then, in the full consciousness of his symptoms and his need, would be likely to accept any terms so imposed upon him. He would, moreover, know after a time from the experience of his fellows what had happened in their case and would hesitate before discontinuing his attendance prematurely. He would learn that he could not throw up all the advantages which he had gained without an effort being made to reclaim him. It need hardly be said that the task of following up patients would have to be entrusted to persons of the appropriate sex carefully selected for the purpose, and to be carried out with tact and discretion. Consideration would have to be accorded to the case of women as distinct from men and also to the classes of women affected. It must also be admitted that the net could hardly be drawn in such a manner that none would escape it. The giving of false addresses and names by those seeking treatment no doubt takes place to an appreciable extent, and the giving of true names and addresses would, in any circumstances, remain difficult to enforce, at any rate in large cities and urban communities. Nevertheless, however great the difficulties may be and however imperfect the result likely to be obtained, the fact remains that the treatment now given is to an appreciable extent ineffective as a measure for the protection of the health of the community. Until public opinion is ripe for compulsory legislation it can be rendered more effective by eliminating from the clinic circumstances and conditions likely to deter patients from continued attendance; by impressing upon them at the clinic the vital importance for themselves and for others of persistency, even when to them the desired end appears to have been attained; and by such following up of cases as may be found in the light of experience to be productive of results. As in every other function of public importance already overtasking those who perform it, extended usefulness will demand in many cases increase of staff and will involve greater expenditure. The stage, however, has not been reached at which the financial difficulty or the precise extent to which voluntary effort may be utilised need be dealt with in concrete terms. Free discussion of the problems involved and the securing of appreciation of them by the lay public appear in the first instance to be desirable. They would form a necessary preliminary to any tentative measures that might follow.

Annotations.

"Ne quid nimis."

FRENCH GOVERNMENT AND TOWN SANITATION.

PARTLY to facilitate the increase of population, which is so necessary in France, and partly in the hope of finding work for the unemployed, Mr. Leredu, the Minister of Public Health, has addressed a circular to all the Prefects, in which he points out that the laws on public health sanction special investigations as to the sanitary conditions of towns. The Minister is urging that a thorough inquiry should be held in all towns where the death-rate is above the average. The use of such a measure is obvious, particularly as during the war little or nothing could be done in respect to domestic or public sanitation. If the water-works, the sewers, the disinfecting stations, were kept in good working order, it was the most that could be expected under the circumstances. But much more was needed, and is now in some places very urgently needed. It may be asked, however, if the fact that the death-rate is above the average is a sufficient reason for neglecting other places where the death-rate is below the average. A town may have a very low death-rate, taken as a whole, and yet there may be a scandalously high death-rate in one or two special districts. Indeed, it is just because the general conditions are so good that the exceptionally dark spots are apt to be overlooked. These slums, bad in themselves, are likely, in times of epidemic, to be centres from which the whole town is infected. During the last great cholera epidemics this was the case, especially at Havre and Hamburg. At Hamburg the deaths from cholera varied from 4·18 per 1000 inhabitants in the Harvestehude district to 27·50 in the Vedde district. Yet all had the same water-supply. At Havre, some of the localities most afflicted had an ordinary death-rate, before the epidemic, of 50 per 1000 per annum, though the town, as a whole, was not particularly unhealthy. Such contrasts are to be found in many large towns, and a moderate death-rate cannot be taken as evidence that plague spots do not exist. Sanitary commissioners have visited and described for us in these columns many such unwholesome streets, blocks of houses or districts which exist in London and in various provincial towns, in England as well as in large continental cities. In Paris, to this day, close to the seat of Municipal Government, the Hotel de Ville itself, and further off, in the XVIII., XIX., and XX. arrondissements, there are still numerous streets where the death-rate is very high and where drastic measures are urgently needed. In such circumstances, all local authorities, whether the general death-rate is high or low, should be called upon to deal with their slums, thus finding, moreover, work for the unemployed while benefiting public health.

CURE DE JEÛNE IN DIABETICS.

IN a recent article [1] Dr. Marcel Labbé describes his experiences with the method of treating diabetes mellitus by means of starvation. He gives the credit to his French colleague, Dr. Guelpa, who introduced a form of fasting and purgation treatment in 1910, but at that time he was not much impressed. The work of Allen and Joslin caused him to experiment again with the fasting treatment with the result that he modified his views. He found that the treatment was of great value in treating diabetic patients who had not lost weight. The glycosuria disappeared and the ketosis was much reduced. He was convinced, however, that the treatment was not a cure, using the word in the sense of a complete restitution. Allen, it should be pointed out, has never claimed that it was. Labbé does not believe that the treatment is of use for the patients who have lost weight, giving several instances in which the glycosuria either did not disappear or reappeared again as soon as any attempt was made to feed the patient. These patients also tended to pass into coma very suddenly. It is, of course, well recognised by those who use the fasting treatment in this country that patients with severe and advanced diabetes have already passed beyond the stage in which striking improvement can be expected. Nevertheless, fasting may improve the condition of the patient enormously since it removes the thirst and pruritus which render his life a misery. For the sake of the diabetic patients in France it is to be hoped that Dr. Labbé's article will induce his colleagues to read the numerous papers and books published in America and also in England, and to practise, with discrimination, the fasting treatment, which was so fully discussed before the Medical Society of London last week (see p. 957).

[1] Annales de Médecine, 1921, vol. x., No. 1.

A RED CROSS HEALTH CAMPAIGN.

IN a paper recently published Dr. C. E. A. Winslow,[1] Director of the Department of Health, League of Red Cross Societies, sketches a programme for a Red Cross health campaign which commands sympathy from the breadth of outlook shown. Nothing less than the amelioration of "all woes of all men"—to quote Swinburne—is contemplated as worthy of the Red Cross, the deepening and broadening of whose ideals is counted by Dr. Winslow as among the greatest of the compensating gains of the war. Of the magnitude of the task thus visualised there can be no question. An annual loss of 9½ million lives in Europe alone from so-called "natural causes" represents a staggering volume of illness and suffering, largely preventable; and it is to the preventive character of the peace-time efforts of the Red Cross that Dr. Winslow draws special attention. The journal in which he writes is itself one of the most interesting and useful developments of international Red Cross activity.

To ensure the voluntary coöperation of the individual citizen without which Government and municipal health authorities can effect little, an educational campaign is imperatively demanded, although the wide diversity of conditions in the different countries makes adherence to any rigid plan undesirable—and, indeed, impossible. Dr. Winslow suggests as a basic feature in a health programme the local establishment of a system of classes under the leadership of the Red Cross, for the study of the principles of hygiene and of local health conditions and needs; a scheme of lectures suitable for this purpose should be outlined, and the practical details connected with the organisation of an adequate health education programme set out. In localities where special societies devoted to particular phases of public health work already exist, the Red Cross may play an important part in coördinating their work and facilitating its execution, an example of this being the agreement entered into in this country between the British Red Cross and the national societies devoted to child welfare, tuberculosis, and venereal disease. Dr. Winslow's scheme is, however, in its essence elastic, and while in many countries child welfare work or tuberculosis work is already adequately covered, he is emphatically of the opinion that in almost all countries there is some important gap which the Red Cross can fill. A section of the paper is devoted to a consideration of the objections that have been or might conceivably be raised to the initiation of such a health programme by the Red Cross. These objections are stated with fairness, but are fully met, and a strong case made out for the extension of the Red Cross functions to a definitely constructive policy—not indeed in any way competing with established organisations or institutions, but

[1] International Journal of Public Health, September–October, 1921.

coöperating with and supporting all public health movements, and in certain cases possibly forming a central clearing house for voluntary activities of this kind.

The national Red Cross Society contemplated by Dr. Winslow is one that should include in its permanent membership from 10 to 20 per cent. of the population of the country, but he points out the impossibility of attaining such a standard unless the members receive something for their membership, and—an even more important point—are given something practical to do for the organisation of which they form a part. We agree with Dr. Winslow that the secret of the strength of the Red Cross movement undoubtedly lies in the fact that it constitutes a challenge to the spirit of human service.

TRYPANOCIDE.

IN a critical review[1] of recent work on the treatment of sleeping sickness, Prof. Warrington Yorke discusses the fundamental assumptions on which C. H. Marshall and S. Vassallo base their optimism as to the efficacy of serum treatment. These assumptions are, broadly speaking, (1) that although the administration of one dose of salvarsan or a substitute is sufficient to sterilise the blood-stream, symptoms reappear within a variable period, averaging about four months, and the disease progresses to a fatal termination; (2) that quite early in the disease the trypanosomes appear to gain an impregnable position in the central nervous system, where they are protected from the action of drugs and whence they can re-infect the blood. We recently pointed out[2] that the presence of trypanosomes in the cerebro-spinal fluid may be fortuitous, and it is by no means proven that they are invariably present at any stage in the course of the disease. Before the 53 successful cases published by Dr. Marshall are accepted as cures Prof. Yorke considers that we ought to know what proportion of cases (1) die, (2) are alive after more or less prolonged periods when untreated, when treated with one or several doses of arsenic or antimony compounds, and when subjected to prolonged treatment. In the absence of sufficient controls to answer these questions Prof. Yorke contends that Marshall and Vassallo have produced no satisfactory evidence that intrathecal injections of salvarsanised serum sterilise infected cerebro-spinal fluids. The doubt expressed by such an authority in tropical medicine as Prof. Yorke on the efficacy of the method which the mission recently organised by the Tropical Diseases Prevention Association was primarily designed to test, adds strength to our plea to the medical officers in charge thereof not to confine their investigations to a single method but to explore trypanocide in general.

CENTRAL COUNCIL FOR LONDON BLIND.

IN pursuance of the scheme for the welfare of blind persons in the County of London, which was approved by the London County Council in July last, the Council has now decided upon the constitution and order of reference to the Central Advisory Council which will be appointed under the scheme. The Council will consist of: (*a*) One representative appointed by each of 19 associations and institutions located in the London area. (*b*) Not more than six persons, selected by the London County Council, with special knowledge of the needs of the blind. (*c*) The chairman and vice-chairman of the Special Committee of the London County Council dealing with the welfare of the blind. (*d*) One representative appointed by the Minister of Health. (*e*) One representative appointed by the Board of Education. (*f*) One representative appointed by the Royal College of Surgeons of England. The County Council will review annually its appointments, and will appoint the chairman. The vice-chairman will be elected by the Advisory Council. The clerk to the London County Council will act as clerk. The order of reference to the Council will be as follows:—

> To assist the London County Council (1) by advising on matters specifically referred to it by that authority and on any other matters to which the Central Council may deem it expedient to direct attention; and (2) in such other ways as that authority may suggest in connexion with the administration of the scheme for the welfare of the blind in London, especially with the object of securing the essential coöperation between the several societies and associations and between such societies and associations and the London County Council.

All meetings of the Central Council and its committees will be held in private, and all expenditure incurred will, after prior sanction, be defrayed by the London County Council. The Special Committee is taking immediate steps to obtain nominations to the Council from the various associations concerned.

OVARIAN GRAFTS.

Prof. Th. Tuffier contributes a valuable surgical study of 230 ovarian grafts to a recent issue of the *Bulletin* of the French Academy of Medicine.[1] These operations were performed with the twofold object of preserving the menstrual flow after removal of the ovaries, when the uterus is left, and of obviating the general disturbance following excision of the ovaries and uterus. Two varieties of grafts were investigated, the homograft derived from another woman, and the autograft, which involved the use of a portion of the patient's ovary. The former was found to be without effect. The autograft, which must be fresh, was placed in the subperitoneal tissue, the subcutaneous tissue, or in the mammary gland. If the graft does not "take" it disappears in from six months to two years. In successful cases no changes were observed for four to five months, the graft then commenced to enlarge and might be painful for a few days before a period was due. When menstruation was re-established, it occurred about five to seven months after the operation, and was often irregular in quantity, duration, and time of recurrence. Dr. Tuffier found the most favourable subjects for grafts to be young adults; in patients over 40 years the grafts were not successful. The average persistence of menstruation in all cases was, however, only one to two years, as the transplanted ovaries appeared to undergo a precocious senescence.

THE TESTING OF CLINICAL THERMOMETERS.

IN reply to a recent question in the House of Commons concerning the inaccuracy of a large percentage of clinical thermometers in use in this country, Mr. Stanley Baldwin, President of the Board of Trade, stated that he hoped next session to reintroduce the Bill dealing with the testing of thermometers, which was introduced by the Government earlier in the session and abandoned owing to lack of time. Mr. Baldwin also stated that most British manufacturers of clinical thermometers are voluntarily having their products tested at the National Physical Laboratory, where the fee charged for large quantities is 3*d*. per instrument, but where any single clinical thermometer can also be tested on payment of a fee of 1*s*. 6*d*. In a circular issued a few days ago by the British Lamp-blown Scientific Glassware Manufacturers' Association, Ltd., it is pointed out that, whilst makers of good clinical thermometers would naturally depend upon the ordinary course of business to obtain orders solely on quality or make, only rarely do instruments bear the makers' name or trade-mark. The bulk are labelled with "Best British Make," or some similar phrase, and it is very difficult to trace the maker of a faulty instrument. This association of manufacturers

[1] Tropical Diseases Bulletin, Oct. 15th, 1921.
[2] THE LANCET, Sept. 10th, p. 573.

[1] Bulletin de l'Académie de Médecine, 1921, No. 30.

consider it desirable that a standard of accuracy should be set up which will show the British article to be above suspicion; they recall the fact that the Order in Council for the compulsory testing of clinical thermometers, which operated from November, 1918, till March, 1921, resulted from the discovery that many instruments supplied to the army were found too inaccurate for use. Large contracts had been hastily placed with every maker, and production was increased regardless of quality. The first tests revealed serious inaccuracy in 25 per cent. of instruments tested; rejection of this proportion speedily reduced the percentage to 5, and at the time of the abolition of the test the rejections had fallen to 1½ per cent. In November, 1919, 135,000 thermometers were tested monthly, under the compulsory regulation; in March, 1921, when the testing of exported thermometers was abolished, 65,000 were submitted, and in June, when the compulsory test was itself abolished, 55,000 was the quantity under test. We agree with the manufacturers who are responsible for the publication of this circular that it is superfluous to comment on the unwisdom of abandoning the principle of a strict test at a time when France, Japan, Germany, and certain States in the U.S.A. have all instituted compulsory legislation dealing with the matter. It will be recalled that a special clause, forbidding the sale of any clinical thermometer not approved by the Ministry, formed part of the Ministry of Health Miscellaneous Provisions Bill introduced in 1920. On the occasion of the defeat of that measure in the House of Lords one speaker referred to the clause in question as an example of grandmotherly interference; but in the report for 1919 of the National Physical Laboratory it is stated that in one month of that year, of 9000 clinical thermometers submitted for testing by a single firm, 28 per cent. were rejected as being in some way unfit for use. The medical man can no doubt see to it that his own instruments are accurate, but when the periodical taking of temperatures is left in the hands of a lay person the use of a faulty thermometer may be attended with disastrous consequences.

PHYSICAL EXERCISE IN HEART DISEASE.

Dr. C. W. Chapman called attention in our correspondence columns of Oct. 22nd to the merit of the Burke Foundation, N.Y., in popularising the notion of occupation therapy for cardiac patients in America. Not long ago Sir James Mackenzie[1] described the observation of response to effort as the most important method of estimating the heart's efficiency, adding that the method is "apparently so simple that everybody feels confident that he has recognised it, used it, and exhausted its possibilities," while, as a matter of fact, few people have given it the study it requires. It is no less true that physical exercise as a therapeutic measure in cardiac disease has suffered from neglect, a lacuna which Dr. Theodore Barringer, jun.,[2] in a recent paper on the subject, ascribes mainly to the prevalent but mistaken idea that the chief cause of heart failure in patients suffering from cardiac disease is physical overstrain. In an earlier investigation made by him[3] of the clinical records of 154 cases of heart failure complicating chronic valvular or myocardial disease, it was found that in only three cases was there a definite history of physical strain immediately preceding the onset of symptoms, the dominant factor undoubtedly being that of infection. Dr. Barringer in his later papers describes the blood-pressure reaction during and after exercise in normal persons and in persons with heart disease. In the normal individuals experimented on it was found that the pressure rose during work, the degree of rise being proportional to the intensity of the work; and that this height was maintained for the first 60 seconds after work. In the patients with heart disease the pressure which rose during work rose still further on the completion of the work, the rise at both periods being much more marked than in the normal controls. A delayed rise and prolonged fall were noticed whenever the work over-taxed the heart. As the object to be aimed at in giving exercise to a diseased heart is so to grade the exercise that the heart muscle is stimulated to contract more energetically, thus increasing both the output per beat and the supply of blood to the muscle while avoiding any degree or duration of exercise which would fatigue the heart, the height of the blood-pressure curve affords in the majority of patients a convenient indication as to the effect of a given exercise on the heart. A rise of more than 20 mm. of mercury from the pre-exercise level indicates an energetic and favourable reaction in the absence of any signs of over-taxation of the heart. Among the forms of exercise recommended by Dr. Barringer are various movements with dumb-bells from 1 to 15 lb. in weight, stair-climbing, and skipping, for the more energetic exercises, and walking, croquet, and arm and leg exercises for the milder forms, the selection of the particular type for each case being based on the amount of increase in the systolic blood pressure after exercise. The mild form should as a rule be used for patients with small cardiac reserve power, and also to supplement the more energetic exercises. Dr. Barringer concludes by a statement of his opinion that physical exercise increases both the resistance to general infections in patients with heart disease precisely as it does in normal people, and the resistance of the heart muscle itself to reinfection leading to heart failure, insisting that there is no excuse in most cases for advising heart patients against exercise, or for vagueness and indefiniteness in prescribing this valuable therapeutic measure. Dr. Barringer's findings refer mainly to adult patients, but Dr. May Wilson[4] studied the circulatory reactions to graduated exercises found in normal children and obtained similar results. She also formulated a working table of standardised test exercises followed by normal systolic blood-pressure curves without symptoms of dyspnœa and fatigue, by the use of which she convinced herself that in children with chronic organic heart disease exercise tolerance tests are of undoubted value as a scientific basis for the regulation of the child's activities. Dr. Wilson endorses Dr. Barringer's dictum that the widespread fear of exercise in heart disease is unwarranted.

[1] THE LANCET, June 11th, 1921.
[2] Jour. of Amer. Med. Assoc., July 2nd, 1921. Amer. Jour. of Med. Sciences, July, 1921.
[3] Jour. of Amer. Med. Assoc., April 23rd, 1921.

COORDINATED HEALTH SERVICES IN WILLESDEN.

AN interesting feature of Dr. G. F. Buchan's report for 1920 as medical officer of Health for Willesden urban district is his description of a scheme for the coördination of medical services. This scheme Dr. Buchan claims to be much on the lines indicated in the Dawson Report and to have been set going two years before this report appeared. For purposes of health organisation Willesden is divided into four areas of approximately equal size, each of which is in charge of an assistant medical officer, who is the pivot of the public medical work of his area and controls within his district infectious diseases, maternity and child welfare work, and school medical work. He has at hand for the elucidation of cases of difficulty, the services of part-time consultants appointed by the urban district council and a hospital with beds for the observation or treatment of cases when necessary. In this way Dr. Buchan is satisfied that there is available for patients attending the council's clinics the best possible medical skill for diagnosis and treatment. He admits that neither the clinics nor the hospital are as yet fully equipped, but when this is achieved the mothers and children will be in a position to know that the local authority has left nothing to chance in its endeavour to secure healthy child life. The advantage of the medical arrangements consists

[4] Amer. Jour. of Diseases of Children, September, 1920. Jour. of Amer. Med. Assoc., June 11th, 1921.

in placing under the control of one medical officer the care of the child before birth, after birth up to five years of age, and during school life, so that preventive measures may be studied and applied in the early years and a minimum amount of work consequently be required later. This ideal has not yet been attained, even in Willesden, because owing to the mass of defects discovered amongst children, and the urgent need for treatment, time has not hitherto been available for the study and application of measures for prevention which should proceed pari passu with treatment. It is obvious that, if and when desired, the Willesden scheme might readily constitute the germ of a public medical service by salaried doctors. Each municipal clinic has its service of doctors, dentists, district nurses, and health visitors, with the use of a municipal hospital and the services of consultants when needed. Domiciliary medical treatment could be added by an increase of the medical staff of the clinic. The public of Willesden appear to like the arrangement.

TURTLE VACCINE.

JUDGING from the interminable discussions in the German medical press since the armistice, Friedmann's remedy still continues to excite interest. The appearance of a critical monograph[1] on the subject is now welcome: it is in the form of a supplement to the *Zeitschrift für Tuberkulose*, one of a series published under the general editorship of Prof. Lydia Rabinowitsch, who has herself recently done some work on the remedy. The stuff, it will be remembered, came before the medical public with a disconcerting flourish of trumpets two or three years before the war, and was then reputed to consist of a vaccine prepared from a living avirulent culture of an acid-fast bacillus isolated from the turtle. Since the war the vaccine is stated by its critics to contain also attenuated human tubercle bacilli. The monograph sets out to investigate carefully the whole question of Friedmann's remedy. A careful analysis is given of the published literature on its value as a means of treatment in tuberculosis. Dr. Ulrici and Dr. Grass have collected records of more than 80 authors, dealing with many hundreds of cases of pleurisy, phthisis, abdominal tuberculosis, meningitis, Addison's and other diseases. In a second section Dr. S. Meyer sets out his investigations into the cultural properties and pathogenicity of the vaccine, with animal experiments designed to test both its protective power as an immunising agent and its curative power in guinea-pigs experimentally infected with bovine and human strains of tubercle bacillus. The conclusions on both counts throw doubt on the value of Friedmann's turtle vaccine.

INTERNATIONAL CONGRESS OF OTOLOGY.

THERE has been no international congress of otology since the meeting in Boston in 1912. The various national committees then appointed have been canvassed and have selected Paris for the tenth congress to be held next year. The cordiality and goodwill of the French Committee towards this country have been marked by a special visit of their secretary-general, Dr. A. Hautant, who came over on purpose to attend the annual dinner of the Section of Otology of the Royal Society of Medicine under the chairmanship of Sir Charles Ballance. He joined in the first meeting of the section on Oct. 21st, when the new President, Dr. Logan Turner, occupied the chair and gave the address which we briefly report on p. 961. Dr. Hautant made the acquaintance of many otologists in London and extended to them and their colleagues a cordial invitation to the congress next summer. A committee of organisation for Great Britain and Ireland has been appointed with Prof. Urban Pritchard as President and Sir StClair Thomson as chairman of the committee and the hon. secretaries are Mr. Lionel Colledge and Mr. J. S. Fraser. No less than 100 otologists have already sent in their adhesion to the committee, and all who are interested are invited to apply to one or other of the hon. secretaries. Those who do so will be kept informed of all the arrangements for the congress as they develop. The office-bearers in Paris are Prof. P. Sébileau (President), Dr. Georges Laurens (treasurer), and Dr. A. Hautant, 28, rue Marbeuf, who is secretary-general. Although the congress remains in name purely otological, it is intended to embrace both rhinology and laryngology. Prof. Sébileau is known not only as an otologist but as a leading exponent of the surgery of the nose, throat, and neck. We are glad to hear that the congress will have a marked practical character, the mornings being devoted to visits to clinics, operating theatres, and museums.

Further details can be obtained from the secretary-general or from the secretaries of the British Organising Committee.

INVOLUTION OF THE UTERUS.

THE conditions that determine the involution of the uterus after parturition are of paramount importance, and they can perhaps be more definitely established in animals than in the human subject. C. Kuramitsu and Leo Loeb have made experiments on rats and guinea-pigs[1] to determine the influence of suckling and castration on this process. The degree of involution was determined quantitatively, and the condition of the whole uterus was compared with that of its individual component tissues. It was found that the process of involution was similar in rats and guinea-pigs, and that sucking accelerated the process; when sucking was suppressed the process was retarded. Castration made it more active. The effects of sucking and castration add to the normal involution changes, and both processes affect all the chief constituents of the uterus, and powerfully influence the growth and structure of the respective tissues. The influence of castration is opposed to that of the suppression of sucking, but when both occur the influence of the former overcomes that of the latter. In guinea-pigs lactation does not interrupt the functional cycle of the ovary and uterus, though it does so in the rat. Sucking or its cessation act indirectly on the uterine tissues. As a corollary to this research, the observers studied the direct effects of lactation on the sexual cycle in the rat and guinea-pig. In the rat ovulation during lactation is inhibited. In the guinea-pig, which suckles its young, ovulation and the normal cycle of changes in the ovary take place. Possibly the corpus luteum functions for a longer time in the rat.

REFRACTIVE CHANGES IN LATER LIFE.

CORRECTION of errors of refraction cannot be properly performed by mechanical rules alone. Even presbyopia needs to be corrected with intelligence, having regard not only to the age of the patient and the purposes for which the glasses are prescribed, but also to the fact that the accommodation of different individuals of the same age varies considerably. The eyes of children frequently undergo considerable changes in the course of their school life, the tendency being for hypermetropia to become less in degree, for low hypermetropia or emmetropia to become myopia, and especially for astigmatism to change from the hypermetropic variety into the mixed and from the mixed into the myopic. It was not, however, of these changes that Mr. Ernest Clarke was speaking in his interesting paper on "Milestones in Refraction Work," read at the Ophthalmological Section of the Royal Society of Medicine and briefly reported last week. There are other refractive changes which take place during mature life. Apart from progressive myopia

[1] Tuberkulose-Bibliothek: Beihefte zur Zeitschrift für Tuberkulose; Nr. 3.—Kritische Wertung des Friedmann-Mittels. By H. Ulrici, H. Grass, and S. Meyer. Leipzig: Johann Ambrosius Barth. 1921. Pp. 46. M.16.

[1] American Journal of Physiology, vol. lv., 1921.

and from the changes which sometimes take place late in life as the result of an alteration in the refractive index of the crystalline lens, these changes have attracted little attention; many an oculist when he finds a difference of, say, half a dioptre of astigmatism in the refraction of a patient compared to the record of his earlier adult years is inclined to attribute the circumstance to an error of observation on the former occasion, whether on his own part or on that of a colleague. It is satisfactory to be assured by one who has recorded these changes during a period of 40 years that they do actually occur. Mr. Clarke did not explain the mechanism by which they are effected. In the case of an increase in the axis of the eye in one meridian we can understand it by supposing a yielding of the sclera, as in myopia. In the case, however, of a decrease of myopia or increase of hypermetropia or hypermetropic astigmatism, it is difficult to understand, unless we suppose that at the first test the ciliary muscle was incompletely paralysed. A still more difficult phenomenon to understand is an alteration in the axis of astigmatism which is said sometimes to take place. Since most tests for the angle of oblique astigmatism are subjective, the chances of an error of observation are considerable. Yet Mr. Harrison Butler, in the discussion that followed Mr. Clarke's paper, asserted that changes in the axis do actually take place—by what mechanism he did not explain. He did, however, remark that the angle of the cylinder required for reading glasses is sometimes different from that required for distance, and we may make the suggestion that the action of the oblique muscles, one of whose functions is to keep the axes of the eyes parallel, has something to do with it. The subject is one that requires further investigation on the part of those who have the opportunity of following up their refraction cases during a long series of years.

THE FIRST MITCHELL LECTURE.

THE history of the foundation of this lecture is as follows. The late Mr. F. W. Mitchell, a Birmingham manufacturer and a good citizen, was a liberal giver to any object which appealed specially to his views. He was interested in social-hygienic questions and had often expressed a wish to do something towards the "prevention and cure of consumption." With such an object in view he, altogether unsolicited, sent Sir Edward Malins a sum of money, which the latter forwarded to the Royal College of Physicians of London, and this was by the College used to found a biennial lecture on tuberculosis. To Dr. Parkes Weber has fallen the honour of delivering the first of these lectures, which will be found in the opening pages of this issue.

SUBLUXATION OF THE SHOULDER DOWNWARDS.

Dr. F. J. Cotton[1] has recently described a condition which appears to be not uncommon and yet has not previously received attention—subluxation of the shoulder downwards in cases of injury, due to the weight of the arm, and made possible by gradual exhaustion of the muscles, particularly of the deltoid. He has for years watched this condition occurring in case after case as a complication of shoulder and arm injuries, yielding promptly if treated early, becoming troublesome if neglected. He considers that many cases diagnosed as circumflex paralysis belong to this group. Dr. J. W. Courtney has shown that altered electrical reactions, even the reaction of degeneration, do not prove the nerve origin of paralysis or exclude a mechanical origin by stretching of muscle with consequent displacement of the head of the bone downwards. The type of case in which this occurs is uncomplicated fracture of the humerus, in which the weight of the heavy and perhaps swollen arm suspended, as in the routine treatment, only by the wrist, tires out the supporting muscles. A subluxation downwards, which is well shown in a radiogram taken with the patient standing, gradually appears. In the supine position the subluxation disappears. Eight out of nine cases seen in private occurred in women whose ages ranged from about 40 to 70 years. This fact is explained by the combination in them of a heavy arm with weak muscles. The subluxation is easily overlooked, but if the surgeon is on the alert, it can readily be diagnosed by finding a groove below the acromion, which is often visible and always easily felt. If untreated, the arm becomes helpless and stiff, the condition being not unlike that of subdeltoid bursitis, particularly the form complicated by supraspinatus rupture. Treatment consists of early massage, and, as soon as the main lesion allows, exchange of traction for support of the whole arm. Unless the neglect has been too long prompt improvement is obtained. In a quite recent case a stout but vigorous woman, aged 38 years, broke her humerus on April 19th, 1921. The treatment necessarily involved traction, cautious massage being used from May 10th. Traction was abandoned on June 1st and under support, massage, and exercises she recovered with a solid arm and nearly normal function of the shoulder. Older and less vigorous people require much longer treatment, but Dr. Cotton has never seen a case properly recognised and treated that had permanent disability. These cases show for a considerable time not a trace of deltoid power and several show definite electrical changes. He never sees deltoid paralysis from circumflex damage. All the cases seem to be either due to lesions of the brachial plexus or to the condition now described. Thus a photograph, recently sent to him of "isolated circumflex lesion" from a fall on the shoulder, showed marked atrophy of the scapular muscles as well as of the deltoid, and was obviously a partial traction lesion of the plexus.

[1] Boston Medical and Surgical Journal, Oct. 6th.

AWARD OF THE JENNER MEDAL.

AT the first sessional meeting of the Epidemiological Section on Oct. 28th, the Jenner Memorial Medal of the Royal Society of Medicine was handed to Sir Shirley Murphy in recognition of distinguished work in epidemiological research. This medal was founded on the centenary of Edward Jenner's first successful inoculation of cow-pox from one human being to another, and has been awarded for pre-eminence in the prevention and control of epidemic disease. Dr. A. K. Chalmers, in bestowing the medal, spoke of Sir Shirley Murphy's name as worthy to follow those of W. H. Power, Laveran, and Patrick Manson. As the first medical officer of health for Greater London, he set himself quietly and firmly to clear up insanitary areas, whatever they might be, leaving the metropolis, as Dr. W. H. Hamer has put it, one of the best scavenged cities in the world. Sir Shirley Murphy's whole life has been spent in the endless task of caring for the health of London, and all over the world practical sanitarians will endorse the action of the Epidemiological Section in selecting him for signal honour.

THE resumption of the social evenings held by the Royal Society of Medicine was welcomed by a large number of Fellows and their friends who were received by the President, Sir John Bland-Sutton and Lady Bland-Sutton in the library of the Society's House on Oct. 31st. The success of the evening warrants the hope that such gatherings may now take place regularly.

LECTURES BY DR. MARMOREK.—Sixteen lectures, in English, on Experimental Medicine and Therapeutics, will be delivered in Paris by Dr. Alexander Marmorek at the Institut Océanographique, 195, Rue St.-Jacques, beginning Nov. 21st. The lectures will deal with such matters as: experimental production of specific human maladies, biological replacing of organs, experimental syphilis, tuberculin, origin of goitre and diabetes, proteinotherapy, and predisposition in infectious diseases.

THE OUTPUT OF RESEARCH PLACES IN THE UNITED KINGDOM.

BY A. D. WALLER, M.D. ABERD.
(*From the Physiological Laboratory, University of London.*)

MEASURE of the efficiency of a machine is afforded by its output of energy per unit of energy by which it is fed. We are organising new machinery for the acquisition of fresh knowledge by scientific and industrial and medical research; it will obviously be important to measure the efficiency of such machinery, old and new and projected. At what cost is the yearly harvest of fresh knowledge being produced, and how can the harvest be measured? The chief objective measure of the harvest of new knowledge is afforded by publication in scientific journals; the number of original papers published by scientific laboratories affords measure of the activity of such laboratories, and when taken in ratio with the annual cost, affords measure of their comparative efficiency as research factories. It would be impossible for any single person to undertake a numerical survey of the whole field. It is comparatively easy, however, to carry out a rational survey of a limited portion of the field, by enumerating, e.g., the number of contributions from recognised scientific laboratories to their common outlet of publication, in London—i.e., through the Proceedings of the Royal Society.

The table here given represents the outcome of such a limited survey of the field of biological science.

Proceedings of the Royal Society: Series B Papers of a Biological Character.

Year and volume.	Univ. College.	King's College.	Imperial College.	Lister Institute.	Univ. of London (Physiol. Lab.).	London hospitals.	Oxford.	Cambridge.	Scotland.	Ireland.	Provinces.	Independent Students.
1905												
76	4	1	6	4	1	3	—	8	3	1	6	17
77	6	—	4	5	2	1	—	5	2	—	6	15
78	1	—	1	2	5	2	1	2	2	—	5	19
79	3	—	4	7	3	6	4	5	4	1	6	8
80	2	1	3	4	7	9	2	3	5	—	8	9
81	3	3	3	7	5	6	5	5	4	—	4	14
82	3	4	3	4	2	5	2	2	3	—	5	15
83	1	—	—	3	2	5	2	6	1	—	5	25
84	6	4	4	5	2	4	4	8	3	—	8	18
85	7	1	5	3	2	6	4	6	3	—	4	28
86	3	—	5	1	1	6	4	2	6	—	4	22
87	1	—	3	2	1	5	3	9	2	—	10	22
88	1	2	—	—	—	9	2	7	2	—	4	20
89	4	5	5	—	1	4	1	10	2	1	4	11
90	1	1	4	4	4	5	—	2	3	—	3	13
1920												
91	1	3	2	—	—	—	—	8	—	—	—	8
Total*	46	25	52	47	40	81	35	88	45	3	82	254

* During 15 years, 1905–1920.

All London schools	291
Schools of the rest of United Kingdom	253
Independent students	254
Grand total	798

inclusive of physiology and pathology as shown by the list of papers published in the Proceedings of the Royal Society during 15 years from the year 1905 (when the division between series *A* and series *B* was first made). Obviously these figures do not afford any measure of the relative efficiency of the several research factories, since no attempt is made to assess "cost of production" in terms of money.

DONATIONS AND BEQUESTS.—The Manchester Royal Infirmary Board at its last meeting ackowledged the receipt of nearly £820, all available for income. A legacy of £360 from the late Mr. John Bardsley, £175 from the late Miss Mary Hardman, and other donations amount to over £280.—The Great Northern Central Hospital has received a grant of £1000 from the executors of the late Mr. Henry Mayer to endow in perpetuity the Julia and Henry Mayer bed at this institution.

THE MOTOR EXHIBITION:
POINTS FOR THE MEDICAL USER.

(FROM OUR OWN CORRESPONDENT.)

THE Fifteenth International Motor Exhibition opens to-day (Friday) at Olympia and the White City, and closes on Nov. 12th. The medical visitor looking for a car will find many from which to select. For the well-to-do colleague there are automobiles costing well into four figures, and alongside them are others priced at from two to five or six hundred pounds. Contrary to what was the case a few years back, this year's Show is marked by the limited number of models produced by the average individual manufacturer. Where once were found half a dozen and more models on a single stage, the average to-day is round about three, resulting in greater concentration on the types made, saving of capital, and reduction in the number of spare parts which have necessarily to be stocked.

A walk round a large number of depôts and factories has resulted in the conclusion that whereas the 1919 exhibition had much to be seen though little that the purchaser could obtain, the 1920 plenty for delivery though not a few lacking in workmanship and quality of material, the 1921 has, as already mentioned, numerous exhibits to suit all purses, and, what is more, cars of excellent construction and good material. The chief points to be noted are that the four-cylinder engine is still the prime favourite, and no doubt rightly so. There are some two-cylinder light cars, and, of course, the opposed air-cooled horizontal engine which is simple and efficient and has advantages in the matter of cheapness of production, though the cylinders are liable after extended use to become oval through bed wear. Detachable cylinder heads, which permit of machined domes, and are therefore less likely to encourage carbon deposit and pre-ignition, with joints which are easily made and permit of ready cleaning of the piston heads, are on the increase. The overhead valve is certainly gaining ground, although more slowly than was expected. The type actuated by the overhead cam seems to be preferable to the complicated rocker and push-rod kind. Water cooling is still the rule, though a novelty in this connexion is the new oil-cooled little Belsize. Four-speed gear boxes are now in the majority, and the final drive is in most cases by spiral bevel, which is both silent and reliable. The efficient worm drive is still a favourite with some makers, and, when made and fitted by a good firm, is undoubtedly hard to beat. Regarding suspension, the half elliptic spring more than holds its own, as does the cantilever. Most cars are now fitted with electric lighting and starting, the British retaining magneto ignition, though the battery type is quite satisfactory and very common on French and American makes.

Apart from mechanical improvements, the Show has other desirable features. Coachbuilders are paying much more attention to the comfort of drivers and of passengers, ample leg room especially being provided, whilst on many cars the seats themselves can be tilted or moved backwards or forwards. What certainly will appeal to the medical profession is the all-weather type of body, such as the Standard people have produced. A moment suffices to convert the open car into a really enclosed vehicle, with panels or curtains which open with the doors. Another point that will appeal to the owner-driver is the increased attention which is being given to the accessibility of working parts. In the past this did not receive nearly as much consideration as it deserved.

The outstanding feature of the Show is the rapid development of the low-powered car, with its consequent economy in the cost of running and upkeep. Many of the 10–12 h.p. cars are quite capable of giving good and efficient service, and will certainly meet the professional demands of the majority of town and country general practitioners.

Public Health Services.

NATIONAL INSURANCE IN MANCHESTER.

THE last meeting of the Manchester Insurance Committee as at present constituted was held on Oct. 25th. The Committee was originally instituted in 1912, and its present chairman, Mr. Walter Davies, has served since its inception. He gave an account of the work of the Committee during the nine years of its existence. At first it consisted of 60 members, but under a recent Act of Parliament it will in the future have 35 members only. The number of insured persons in Manchester entitled to medical benefit at October, 1912, was 254,034, and with varying fluctuations it reached 349,441 in October, 1921. The percentage of women in 1912 was 34, and in 1921 had increased to 40. The highest number on the register was 361,278 on April 1st, 1921. About 650,000 medical cards were sent out by the registration department; over 360,000 letters were received and 260,000 were despatched, the number of forms and notices sent out were very large, while personal calls at the Committee's offices reached 220,000. There are now 266 medical men and 150 chemists on the lists of the Committee. By the end of the year the Committee will have contributed nearly £1,000,000 for treatment, while the medical men have provided over 11 million services of all kinds. The cost of prescriptions dispensed—about nine millions—was over £260,000, while over £120,000 had been spent on sanatorium benefit. On a total expenditure of over £1,400,000 the administration cost only amounted to about 5 per cent. There is a balance on the general purposes fund of £8500. A striking feature of the medical benefit service was the very small number of persons who had applied to be allowed to make their own arrangements for medical treatment—out of 350,000 persons treated there were only 61 such cases. Moreover, the number of complaints received was very small considering the number of services rendered. The relations of the medical profession and the Insurance Committee had been completely harmonious, and that happy state of affairs had conduced to an efficient medical service; while at all times the chemists had rendered loyal service. Mr. Davies referred to the encouragement given by the Committee in the matter of nursing, saying it had become a burning question whether nursing should not be absolutely a part of medical benefit. Mr. Davies said in conclusion: "We began our work amidst strong opposition, we have carried on during a period of national upheaval, and we hand over our work to the new Committee with all the services running smoothly, efficiently, and free from grumbles or complaints of any kind. I think this is a record of which we may well be proud."

REPORTS OF MEDICAL OFFICERS OF HEALTH.

HALIFAX.

DR. J. T. NEECH presents his farewell report and reviews the great improvements and changes which have taken place in health matters during his 21 years' tenure of office. Lead poisoning from the water was common at the beginning of this period and has been abolished by adding milk of lime to the water. Dr. Neech has for 12 years been in the habit of disregarding desquamation and discharging uncomplicated scarlet fever cases from hospital after four weeks with eminently satisfactory results as regards return cases. He tells us that cleanliness in the production of milk still leaves much to be desired and that his "council is beginning to awaken to the necessity of replacing the Goux pail by the water-carriage system.

The Registrar-General's estimate of the population of Halifax in 1920 was for death-rate 105,847 and for birth-rate 106,029. The birth-rate was 18·9, the death-rate 13·3, the infant mortality rate 96, and the total tuberculosis rate 0·87. Dr. Neech concludes his report with an article on the need for better ventilation of the home and especially for the open bedroom window, and gives the result of an inspection made in September, 1920, during congenial autumn weather when out of 1419 houses only 198 had open bedroom windows at night.

DERBY.

In his annual report on the health of the county borough of Derby for 1920, Dr. A. E. Brindley tells us that the Registrar-General's estimate is for death-rate 128,868 and for birth-rate 129,220. Some of the important statistics for 1920 are as follows: birth-rate, 25·9; death-rate, 10·8; death-rate from pulmonary tuberculosis, 0·79, and from other tuberculous diseases, 0·13; and the infant mortality rate, 72·7. The death- and infant mortality rates are the lowest, the marriage-rate the highest ever recorded, and the birth-rate is the highest for 13 years. Among unsatisfactory features, Dr. Brindley notes the continued high prevalence of ophthalmia neonatorum and the fact that persons suffering from venereal diseases are under no obligation to continue under treatment till cured or free from infection; to the latter cause he attributes in part the comparatively large number of deaths from premature birth. Good progress is reported in the provision of housing accommodation, 165 houses having been completed and 1420 others begun. A special subcommittee has been concerned with the renovation of existing houses, additional housing inspectors being appointed and a systematic house-to-house inspection initiated. Less progress was made in getting defects remedied when discovered; of 13,809 defects only 2107 could be put right. Improvements were made at the sanatorium, including the provision of a school room for tuberculous children and a workshop for the adult patients, designed to allay discontent among the ex-Service men. Dr. Brindley expresses the hope that maternity and child welfare work will not be curtailed on the grounds of economy, and refers to the increasing usefulness of ante-natal clinics and the valuable help given by voluntary workers.

PORTSMOUTH.

Dr. A. Mearns Fraser is able to present very satisfactory figures in this his twenty-fifth report. He tells us that the death-rate, 11·1, is the lowest ever recorded, and that the infant mortality rate of 60 "is the lowest ever reached in this or any other of the 20 large towns." The civil population is estimated for 1920 at 233,805. The birth-rate was 25·9. The death-rate from tuberculosis of the lungs 0·84, and from other forms of tuberculosis 0·23. The death-rate from diarrhœa and enteritis under 2 years per 1000 living, 0·09, was also the lowest recorded in the 20 large towns. The municipality manufactures and distributes electrolysed sea-water as a disinfectant. One fatal case of tetanus in a baby was recorded, which was traced to the application to the umbilicus of vaseline contaminated by the grey paper washer inserted under the lid of the vaseline pot. Dr. Fraser, in referring to the disappointing results of sanatorium treatment, expresses the fear that the great overcrowding, due to scarcity of housing accommodation will very seriously affect the tuberculosis rate in the large towns. A chart is given showing the remarkable decline in the infant mortality rate from over 170 in 1900 and 60 in 1920, and Dr. Fraser thinks that the Midwives Act of 1902 has been "not the least factor" in this reduction. The net cost of milk, &c., issued to mothers and children under the Order was £970, which does not seem extravagant for a population of nearly a quarter of a million. A municipal maternity hospital, with accommodation for 14 was opened in April, and is intended for patients whose income is under 60*s.* a week. Much work is done under the V.D. scheme. We note that 723 new patients were treated during the year, and that 311 persons ceased to attend either before completing a course of treatment or before a final test as to cure. As is now well known, Portsmouth has adopted the policy of the Society for the Prevention of Venereal Disease, and Dr. Fraser

includes in the present issue a special report which he made to his authority in February. The special report, couched in temperate language, puts forward the case for what has now come to be known as "prophylaxis."

PRESTON.

Dr. F. A. Sharpe was appointed medical officer of health in August, 1920, and refers feelingly to the tremendous difficulty confronting sanitary authorities at the present time—viz., the vast arrears of work to be overtaken with resources depreciated. On the most vital part of public health administration, that dealing directly with the environment of the people, Dr. Sharpe finds that ground was definitely lost in 1920. The health department, he writes, has had to watch with folded hands the steady progress of deterioration in property unchecked by main repairs. Towards the end of the year there was some improvement, but he doubts the ability of private enterprise in the near future to supply the needs of housing. But in spite of a large proportion of the population being unsuitably housed, the absence of epidemics, good climatic conditions, and an improvement in public knowledge each contributed to a favourable year.

The estimated population for birth-rate was 122,133 and for death-rate 121,950. The birth-rate was 24·43, the death-rate was 13·6, the death-rate from pulmonary tuberculosis 0·91, and from non-pulmonary tuberculosis 0·38. The infant mortality rate was 101. In commenting on the milk-supply Dr. Sharpe writes that the high price and poor quality of the milk sold in the county are rendering it an unpopular diet for the children of the wage-earners, contrasting this state of affairs with New York and other cities of the U.S.A., where a determined effort is being made to produce a clean and reliable article, and where the consumption of milk is at least three times greater than in this country. There were 21 cases of ophthalmia neonatorum notified; 18 recovered completely, in one case one eye was lost and the other injured, in two cases both eyes were lost, one of these babies dying at the age of two months.

SWITZERLAND.

(FROM OUR OWN CORRESPONDENT.)

THE RECENT SMALL-POX EPIDEMICS IN BASLE AND ZURICH.

THE epidemics of small-pox in Basle and Zurich have come to an end. In the latter place some 120 cases were recorded with no death, all cases having been of a very mild type. It has even been suggested that it was not small-pox at all. The outbreak at Basle, however, has proved more serious. There were only 47 cases, but 8 deaths. The epidemic has been very closely studied, and Swiss towns, with their stable populations, are a very proper object for the investigation of an epidemic. Some details which are contained in the report of Dr. H. Hunziker, health officer of Basle, may be of interest. The 47 cases included three persons who had left Basle during the incubation period and developed small-pox abroad. One of them could be traced to Berlin. The disease was brought into Basle by a German railway official on service between Basle and Frankfort who had lodgings in a Basle family. He infected his landlord who developed small-pox, which remained undiagnosed, being taken for chicken-pox. The disease was not brought to the notice of the authorities until a friend of this man developed typical small-pox. Four other cases could be traced to the same source. Afterwards it was found that the first man during his disease, which was of the mild type, had helped to pack about 1000 rolls of butter in a dairy shop, but no cases could be traced to clients of this particular shop. Apart from persons who had contracted the disease by direct contact there remained a considerable number of cases where the source of infection was absolutely obscure. Several of them were known as leading a very secluded life—one was an inmate of an asylum whose whereabouts could be exactly controlled and whose visitors were checked. It was further noticed that all these cases lived within a short radius of the isolation hospital where the small-pox cases were nursed. Dr. Hunziker after careful investigation came to the conclusion that the epidemic in these cases was spread by flies. He corroborates this statement by the following facts. Flies were always found in great number round the small-pox patients; this was noticed in the hot days of July, when there was a great increase of flies. The epidemic subsided when cooler weather set in.

Dr. Hunziker was further able to show that he could, by inoculating the cornea of a rabbit with stuff from flies caught near small-pox patients, obtain a positive result of Paul's reaction. In some cases the incubation period could be observed exactly; it varied from nine to ten days. It was also found that the patients were not infectious during the period of the prodromal symptoms and at the beginning of the rash. Early isolation proved always successful. The age of the small-pox patients varied between 1 and 67 years. Twenty-four cases had never been vaccinated, 16 of them were severe. Eleven cases were vaccinated only once and had never been revaccinated, one being a severe case. Ten cases had been revaccinated, none of them was severe. During the epidemic there was a great rush to the vaccination stations. But there remains still a very large proportion of the population which is unvaccinated. In the cantonal council a motion has been introduced for the adoption of compulsory vaccination. The hope of it being carried, however, is but small.

NATIONAL BABY WEEK COUNCIL.

THE National Baby Week Council held its annual meeting in the Armitage Hall, Great Portland-street, London, on Oct. 25th. Lord Astor, who presided, said that while everybody was talking of economy it was useless to think that economic problems could be solved on any other basis than that of an intelligent understanding of the issues involved. Real economy was not achieved by an indiscriminate reduction of expenditure; a nation which wisely regarded its children as its greatest asset would realise the false economy of unreasonably reducing its output on their behalf. The work of the Council was not confined to the saving of life, but included also the prevention and reduction of incapacity with its inevitable financial burden. Dr. W. Allen Daley, medical officer of health for Blackburn, read a paper on the Economic Value of Maternity and Child Welfare Work, emphasising at the outset the importance of having all the facts in our possession, in order that we may put before the public a convincing statement as to what child welfare work is, and what it does. People who regarded a high infant mortality-rate as a convenient means of weeding out the unfit were wrong; a high death-rate among infants was almost invariably associated with a high damage-rate, many children being allowed to become and to remain unfit. An example of the result of public health work was furnished by the borough of Kensington, which included among its inhabitants two extremes of social class. By means of special work undertaken by the medical officer of health, including the appointment of 15 health visitors for the north, as against 4 for the south, the infantile mortality-rate was lower in North than in South Kensington in 1920 for the first time. The average expenditure on public health work in 1919–20 had been at the rate of 5*s*. 3*d*. per head, of which 1*s*. 4*d*. was spent on treatment for infectious diseases, 1*s*. 7*d*. on tuberculosis, 8*d*. on maternity and child welfare, 3*d*. on venereal disease, 6*d*. on school medical service, and 11*d*. on general administration, inspection, and so forth. Dr. Daley considered that the cost of infectious diseases might be reduced by nursing mild cases of scarlet fever at home instead of in hospitals, a point which was taken up by Major C. P. Lovelock, whose experience was that scarlet fever could be quite satisfactorily isolated in the home without risk of spreading infection. The annual report and balance sheet were unanimously adopted; Mrs. H. B. Irving and Dr. E. Sloan Chesser were re-elected as joint hon. secretaries and Mr. James Marsden as hon. treasurer, with the addition of Mr. Henry Higgs as co-treasurer with Mr. Marsden.

Correspondence.

"Audi alteram partem."

THE FLEET STREET WEEK FOR "BART.'S."

To the Editor of THE LANCET.

SIR,—I wish to appeal through your columns to all the many doctors who are ex-Bart.'s men to support our effort for this hospital. Fleet-street devoted the whole of last week to an effort to lessen the great burden of debt which is slowly stifling the activities of the hospital. Over £40,000 have now to be found each year beyond the income of the institution. Add to this a bank overdraft of £25,000 and the position is plain. Many big movements were successfully promoted last week, and if we are strongly supported by all old students of St. Bartholomew's Hospital, and any sympathisers that they can bring, such efforts will be a real help.

Subscriptions will be gratefully received by the Hon. Treasurer, "Fleet Street Week for 'Bart.'s,'" Anderton's Hotel, E.C. 4.

I am, Sir, yours faithfully,

F. H. WILKINSON,
Joint Organising Hon. Secretary.

Oct. 31st, 1921.

"SUNDAY CLOSING" AT BRITISH SPAS.

To the Editor of THE LANCET.

SIR,—I read with much interest the paragraph in your issue of Oct. 22nd, and Dr. Fortescue Fox's letter in to-day's LANCET. I entirely agree with Dr. Fox. I have given mineral baths for many years, and have a personal knowledge of the treatment practised at some foreign and British spas, and I am convinced that a seven-days' week is a drawback in bath treatment, and that a day's rest is of decided benefit once a week at least, and in some cases twice a week. It would be interesting if some of the physicians at our British spas would give their opinions and experiences on this point.

I am, Sir, yours faithfully,

LESLIE THORNE THORNE.

London, Oct. 29th, 1921.

CONTRACT PRACTICE.

To the Editor of THE LANCET.

SIR,—No one will disagree with the statement made by the Federation of Medical and Allied Societies in THE LANCET of Oct. 22nd that many panel doctors give of the best to the service. But how about the majority? It was stated in 1911 that large contract medical work was bad for patient and doctor. Has the profession changed its opinion? If the system is sound why are such large numbers of patients refusing to see insurance doctors, and why in London, out of 7000 names in the Medical Directory, only about 1400 are on the panel? In the *Daily Telegraph* of Oct. 15th, 1921, Sir Dyce Duckworth, referring to the panel system, is stated to have said, "That it had resulted in general failure and had tended to lower the public respect for worthy practitioners. . . . . The medical profession had been placed in bureaucratic hands, whose tyranny was injurious to its honour, its independence, and its dignity." In the Hearts of Oak *Journal* for October, 1921, a writer stated that in his district 25,000 out of 125,000 insured persons had not chosen their panel doctor. A writer in the *Daily Mail* some time back informed us that 500,000 insurance persons had refused the same "benefit," and if one takes into account the large number of patients who, although they have panel cards, never go near a panel doctor, the number must be millions.

I am, Sir, yours faithfully,

Streatham, S.W., Oct. 29th, 1921. E. H. WORTH.

NATIONAL PROVIDENT SCHEME.

To the Editor of THE LANCET.

SIR,—It is now announced in the daily press that there is a great middle-class rush to enrol in the above scheme, through which hospital doctors are to be had for £1 a year. Four general hospitals in London are named as having joined in the scheme. As regards one of them—the Hampstead General and North-West London Hospital—it may be of interest to state that the Medical Committee, after careful consideration of the working arrangements (prospectus dated September, 1921), have informed their board of management of their unanimous decision that the members of the honorary medical and surgical staff are not prepared to take any part in the working of the scheme. A majority of the medical committees of the London general hospitals seem to have acted in the same way, and to have been supported by their governing boards. It is difficult to see how the medical staff of any hospital can retain the title of honorary and at the same time become the paid servants of a commercial insurance company which buys their hospital time and services.

I am, Sir, yours faithfully,

G. A. SUTHERLAND,
Senior Physician to the Hampstead General Hospital.

Oct. 31st, 1921.

Obituary.

FRANCIS ARTHUR BAINBRIDGE, M.A. CAMB., M.D., D.Sc., F.R.C.P. LOND., F.R.S.,

PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF LONDON.

BY the premature death of Francis Arthur Bainbridge, at an age when he had hardly reached the fullness of his power, medical science loses a worker who had made substantial contributions to several of its other branches, before he settled down to follow his natural bent as a teacher and investigator in physiology. At one time he had intended to give himself to clinical medicine, though even then he was making important contributions to pure physiology; indeed, his work on the relation between lymph-flow and glandular activity, dating from this period, is perhaps the most clearly finished of his investigations. Later he turned for a time to general pathology, holding for some years the Gordon lectureship at Guy's Hospital. For a further period he was on the bacteriological staff of the Lister Institute, and several publications on the food-poisoning group of bacteria form a record of sound work in this department of experimental medicine. His real chance, to follow the line of his most genuine inclination, came with his appointment to the chair of physiology at Newcastle. Here he began a valuable series of investigations on the mechanisms coördinating the activities of the heart and the respiratory centre, which he continued after his return to St. Bartholomew's to the chair of physiology there, and which he had still in hand to the end. His own personal contact with these problems, and the wide and critical knowledge of the literature which he acquired in their pursuit, gave a high value to the monograph on "The Physiology of Muscular Exercise," which he published at the end of 1919, and which met with warm appreciation from all who could value its sound and scholarly qualities. As a teacher he was conscientious and increasingly successful, and gave evidence of the high standard which he achieved, to a wider circle than that of his own immediate pupils, in the well-known student's Text-Book of Physiology, which he wrote in collaboration with his colleague at Newcastle, the late Prof. J. A. Menzies. The loss of these two, in the space of a few months, is a loss which the teaching of physiology in this country will find very difficult to make good.

The following appreciation of Bainbridge has been written for us by one with the very best opportunities of knowing him as he was.

"To those of us who, knowing him intimately, could appreciate the fine qualities of his brain and his character, it seemed that he came rather late to the full recognition which he deserved. His early tendency to diffuse his interests had some part in this, and his career was not without its discouragements, met with a quiet persistence which was characteristic and admirable. His physique, his voice, his quiet manner, were not such as easily command attention, and in presenting his own work to his colleagues he had not, at first, that gift of vividness which strikes the imagination. Yet by quiet determination and conscientious work he made himself an unusually successful teacher of his subject, and caution and reticence had their own reward in the sincere and growing respect with which his work, his knowledge, and his judgment were regarded by his fellow physiologists.

There are many, without as well as within the circle of physiologists, who will mourn the loss not only of a valued colleague, but of a dear and staunch friend. To the writer this sense of a double loss comes with a peculiar intensity. A personal intimacy and scientific comradeship, beginning when, as boys at school, we started to read Foster's Physiology together, lasted unbroken through student days at the same college and the same hospital, and survived all minor separations of domicile or of interest to the end. This loyalty was an outstanding quality of Bainbridge's character. In a circle of widening friendships, he kept and cherished those of his boyhood and youth as few men do. A friend to both of us from Cambridge days writes to me, very truly, that 'Bainbridge was one of the exceedingly few people in whose case a long absence was merely a temporary gap, not a separation and a change.' Family affection and early friendship struck very deep roots in a character which was quiet, reserved, and firm, rather than facile and enthusiastic. During the last few years ill-health had made sad inroads on his time and his strength. He chafed at the enforced interruption of his work, but looked to the future with quiet courage and determination. To his widow, gallant comrade in his success and in his losing fight with physical adversity, to his sisters and his young daughter, will go out the sympathy of all who had come to know and honour his steel-true character; and science will be the poorer for the cutting short of a career, which still showed as much of promise as of achievement."

FREDERIC THORNE, M.D. ST. AND., M.R.C.P. LOND.

Dr. Frederic Thorne, who died at Adderbury East, Banbury, on Oct. 16th, in his seventy-sixth year, was a younger brother of the late Sir Richard Thorne-Thorne, sometime principal medical officer to the Local Government Board. Like him, he received his medical education at St. Bartholomew's Hospital, qualifying M.R.C.S.Eng. in 1869, and becoming later M.R.C.P.Lond. and M.D. St. And. His professional career began with 20 years of general practice at Leamington, followed by consulting work—he was on the staff of the Midland Counties Home for Incurables—from which he retired ten years ago, entering then with great activity into public life. He was elected a member of the Banbury rural district council in 1911, and held various offices on that body, including that of chairman of the public health committee. In his early days he had held a commission in the Warwickshire Volunteers, and after the outbreak of war, when the Volunteer Force was formed, he took over command of the Banbury Company in spite of indifferent health. Under his guidance the company grew in strength and efficiency and when it became absorbed into the general military system he was appointed a Captain in the Oxford and Bucks Light Infantry, to which his battalion had been affiliated. For the past two years he had suffered from an internal malady and his death, which is mourned by a wide circle of friends, was not unexpected. Dr. Thorne was thrice married, one of his sons being Dr. James Thorne of Edinburgh.

CHARING CROSS HOSPITAL: A NEW WARD.—The new ward at Charing Cross Hospital, which was dedicated by Princess Louise, Duchess of Argyll last month, owes its inception to the Shanghai Race Club which, during the war, continued racing and devoted the proceeds to charitable purposes. By the end of 1920 the Club had distributed something in the neighbourhood of £120,000. The new ward has been endowed with a sum of £12,000, and the stewards have undertaken to make what contributions they can towards its upkeep.

Medical News.

UNIVERSITY OF CAMBRIDGE.—The following degrees have been conferred:—

M.B. and B.Ch.—L. W. Jones, Emmanuel.
M.B.—L. P. Garrod, King's; H. H. Brown, Caius.

CAMBRIDGE TUBERCULOSIS COURSE.—A course of lectures, demonstrations, and practical work on the pathology, diagnosis, and treatment of tuberculosis, with special reference to administrative measures for dealing with the disease, is being arranged for the month Nov. 14th to Dec. 17th, at the Medical School, Cambridge, and the Papworth Colony. Further details in our advertisement columns.

MEDICO-LEGAL SOCIETY.—A meeting of this Society will be held at 11, Chandos-street, London, W., on Tuesday, Nov. 15th, at 8.30 P.M., when a paper will be read by Dr. Thomas Good on Nature *versus* Law, with special reference to the development of psychotherapy and its problematical use in the treatment of feeble-minded persons and criminals. The annual dinner will be held on Wednesday, Dec. 14th, instead of as previously announced. Further particulars will be announced shortly.

ROYAL SOCIETY.—The President and Council wish to continue the collection of engravings and photographs of Fellows in their possession on the lines which have been adopted by the trustees of the National Portrait Gallery—namely, by photographs uniform in size and character, which will be stored and catalogued. Arrangements have been made with Messrs. Russell and Sons, 73, Baker-street, London, W., by which they will take a photograph (by appointment) of any Fellow, free of charge, and deposit a copy with the Society. Those Fellows who have not within the last two or three years given a sitting to Messrs. Russell are asked to assist in making the collection complete by arranging for a sitting as soon as possible.

HOSPITAL SATURDAY IN MANCHESTER: A SECOND APPEAL.—During last week a second and special collection in aid of the Hospital Saturday Fund was made in places of business, factories, workshops, and warehouses in Manchester and Salford. The second appeal was made because in June last—the usual time for the appeal—many sources of income were closed on account of the coal dispute. The response was, in fact, £4000 short of the contributions of the previous year. In Manchester, as elsewhere, the hospitals are faced with a falling income. At the Ancoats Hospital during the last nine months the expenditure exceeded the income by over £3000. In past years the people of Manchester do not appear to have subscribed to their own hospitals to nearly the same extent as other large towns do. Last year the 21 local hospitals provided treatment for 36,640 in-patients, 343,344 out-patients, 20,824 home patients, and 64,217 sufferers from accidents—a total of 465,025 cases. There are also two convalescent homes for workers, one at Deganwy, in North Wales, with 50 beds, and one at Arnside, with 31 beds for women only.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary Comitia was held on Oct. 27th, Sir Norman Moore, the President, being in the chair. It was announced that Mr. Ronald Henry Knight had been elected as the twenty-ninth Jenks scholar.—Dr. A. J. Cleveland and Dr. F. H. Jacob, elected at a previous meeting, were admitted to the Fellowship.—The following were admitted to the Membership of the College: Dr. J. R. Bell, Dr. W. H. Best, Dr. R. E. Collins, Dr. G. C. Linder, Dr. A. G. Maitland-Jones, Dr. W. E. Waller, Dr. P. H. Wells.—Licences to practise physic were granted to 77 candidates who had passed the necessary examinations.—Dr. Sidney P. Phillips and Dr. G. F. Still were nominated by the President to serve on a committee called together by the College of Preceptors to consider the physical education of girls.—Dr. M. K. Robertson was granted permission to resign his membership of the College.—The application of Dr. J. J. Macwhirter Dunbar for restoration of his membership resigned in 1881 was read a second time.—Prof. C. S. Gibson was appointed an examiner in chemistry in place of Dr. Le Sueur, deceased.—A committee was appointed to consider changes in the curriculum and examination for the Conjoint Diploma, consisting of the President and Registrar ex officio, Sir William Hale-White, Sir H. D. Rolleston, Sir James Galloway, Dr. H. M. Fletcher, Dr. G. F. Blacker, and Sir John Broadbent.—The High School for Girls, Wimbledon, was recognised for instruction in chemistry, physics, and biology.—Sir William Hale-White was re-elected a member of the Committee of Management.

ABERDEEN UNIVERSITY CLUB DINNER.—The Aberdeen University Club, London, holds its sixty-sixth bi-annual dinner at Gatti's Restaurant, on Thursday, Nov. 17th, at 7.30 P.M. Graduates desirous of attending the dinner or of becoming members of the Club should apply to Dr. W. A. Milligan, 11, Upper Brook-street, London, W.

GARDEN CITIES AND TOWN PLANNING ASSOCIATION.—The second lecture of the series organised by this association on Great Cities of the World will take place at 5.30 P.M. on Thursday, Nov. 10th, at King's College, Strand. Dr. H. P. Berlage, of The Hague, will lecture on Amsterdam, Past and Present. Sir Walter Townley will be in the chair. The lecture will be given in English and tickets can be obtained from the secretary of the association, at 3, Gray's Inn-place, Gray's Inn, London, W.C. 1.

SOCIETY OF M.O.H.'s: TUBERCULOSIS S.W. SUB-GROUP.—At the first meeting of this sub-group, held at Bristol on Oct. 22nd, members attended from Weston-super-Mare, Bristol, Exeter, Barnstaple, Salisbury, Paignton, and Plymouth. Grievances were discussed in connexion with the drawing up of reports to the Ministry of Pensions, with the advertisement of resident appointments in sanatoriums carrying a salary of £500 to £700 per annum, with board and residence, confined to unmarried men, and with the insecurity of tenure of tuberculosis officers. It was agreed to coördinate the work of officers of the group on the effect of marriage, pregnancy, and parturition on tuberculosis. Domiciliary reports from general practitioners were held to be generally valueless. The acting hon. secretary of the sub-group is Dr. F. G. Bushnell, tuberculosis officer for Plymouth.

LITERARY INTELLIGENCE.—Messrs. William Heinemann, Ltd., announce the early appearance of "Surgical Exposure of the Deep-Seated Blood Vessels," by Dr. J. Fiolle and Dr. J. Delmas; "Surgical Treatment of Non-Malignant Affections of the Stomach," by Dr. C. G. Cumston and Dr. Georges Patry; a new and revised second edition of Dr. Thomas D. Luke's "Manual of Physiotherapeutics"; "The Practitioner's Manual of Gynæcology," by Dr. A. G. Magian; "History of Electro-Therapy," by Dr. Hector A. Colwell; "Rickets," by Dr. J. Lawson Dick"; "Influenza," by several authors, edited by Dr. F. G. Crookshank; and "Dosage Tables for Deep Therapy," by Dr. Friedrich Voltz, edited by Dr. Reginald Morton.—The J. B. Lippincott Company announce the following new publications: "Gynecology," by Brooke M. Anspach; a third edition of "Obstetrics," by G. P. Shears and P. F. Williams; a twelfth edition of White and Martin's "Genito-Urinary Surgery," by Edward Martin, B. A. Thomas, and Stirling W. Moorehead; "Brain Injuries," by William Sharpe; "The Basis of Psychiatry," by Albert C. Buckley; and "Scurvy," by Alfred F. Hess.

ROYAL MEDICAL BENEVOLENT FUND.—Following is a summary of some of the cases relieved at the last meeting of the Committee held on Oct. 11th. The amount voted was £137 to 29 cases.

L.S.A., aged 78, married. Practised in London, but through an epileptic seizure is quite unable to work. His wife has been earning a livelihood as a clerk, but for the past 12 months has had very little to do owing to trade depression, and they have had to sell their belongings to be able to live. The applicant's only income is 10*s.* per week from the Old Age Pension. Rent 11*s.* a week. Voted £5 and £26 in 12 instalments.

Daughters, aged 63 and 65 respectively, of M.R.C.S.Eng. who practised in Acton and died in 1902. The younger sister suffers from spinal curvature and requires a lot of attention. Owing to failure of dividends their income has been greatly reduced, and with a friend's help of £22 they only received the total sum of £108. Their rent for two furnished rooms is 30*s.* per week. Voted £18 in 12 instalments each.

Widow, aged 56, of M.R.C.S. Lond. who practised at Birmingham and died in 1913. Applicant is a trained nurse, and during her late husband's illness took a house as a nursing home. After his death she had to give up the home as her own health broke down, and she went abroad as a companion and unfortunately contracted malaria, and during convalescence discovered that her lungs were affected; she returned to England and received treatment at Midhurst Sanatorium, and lived with her mother until her death. Applicant now asks the Fund for assistance as the pension which her mother received as an officer's widow ceased at her death. She would like to take a country cottage to keep poultry and bees. Voted £18 in 12 instalments.

Widow, aged 69, of L.R.C.P.Edin. who practised in London and died in 1897. Applicant was left totally unprovided for, and owing to old age and infirmity she is entirely dependent on daughter who is the widow of a soldier, and her only income is derived from a pension of £1 6*s.* 8*d.* per week and what she is able to make by letting. She had a post as a clerk, but this terminated last month. Applicant is asking the Fund for assistance owing to her inability to maintain herself. Voted £26 in 12 instalments.

Widow, aged 35, of M.B.Edin. who practised in Hull and died in May, 1921. Applicant is left totally unprovided for with three small children. Her late husband was only insured for £100, and the majority of this was paid away in funeral and other expenses. At the time of this application she has only £50, and her parents with whom she and her children are now staying are not in a position to continue assistance. Voted £20 in four instalments.

Widow, aged 30, of M.R.C.S. Eng. who practised at Flaxton and died in 1919. Applicant endeavoured to earn a living by shopping on commission and the last 12 months made about £50; she also received £25 from the O.F.F. Applicant and her little daughter are dependent on relatives for a home. Voted £20 in four instalments.

M.B. Edin., aged 71. Practised in Vancouver and Taunton. Through paralysis has had to apply to the Fund for help to pay the fees at the convalescent home connected with the National Hospital, to which he has been sent after receiving treatment. Voted £25 4*s.* towards convalescent home fees.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters J. Symonds, K.B.E., F.R.C.S., at 11, Chandos-street, Cavendish-square, London, W. 1.

BELFAST UNIVERSITY SERVICES CLUB.—The third annual dinner will be held on Friday, Nov. 11th, 1921, in the Great Hall of the University at 6.45 P.M.

IRISH MEDICAL SCHOOLS AND GRADUATES ASSOCIATION.—The autumn meeting of this association will be held at Pagani's Restaurant, Great Portland-street, London, W., on Thursday, Nov. 17th, at 7 P.M. Members will dine together at 7.30 P.M., Maj.-Gen. W. Wallace Kenny, C.B., taking the chair. Dinner tickets from the hon. sec., Dr. F. Howard Humphris, 8, West Chapel-street, London, W. 1.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.—A dinner to celebrate the centenary of the Society was held on Oct. 28th in the hall of the Royal College of Surgeons. The chair was taken by Prof. F. M. Caird, the President of the Society. There was an attendance of about one hundred, the company including Sir J. Bland-Sutton, Sir Alfred Ewing, Prof. F. O. Bower, Dr. Byrom Bramwell, Sir James Mackenzie, Dr. George Mackay, Dr. W. K. Hunter, Dr. J. F. Fergus, and Prof. F. J. Charteris. The toast of the King having been honoured, Sir J. Bland-Sutton proposed that of the Medico-Chirurgical Society of Edinburgh, and read a congratulatory message from the Royal Society of Medicine. He referred to the part played by the Society in the cause of medical science, and to the great advances made in all branches of medicine and surgery in recent years. Prof. Caird, in reply, made some interesting references to the early history of the Society. He spoke of the part played by its first President, Dr. Andrew Duncan, senior, in the foundation of the Royal Asylum at Morningside, and reminded the company that the second President was Sir James Young Simpson, and the third, Lord Lister. The Society had proved a mirror of the events passing in the medical world around them, and its members had endeavoured to add their share to the quest of knowledge. The toast of Sister Societies was proposed by Dr. George Mackay, and replied to by Prof. Bower, Dr. Hunter, and Dr. Davidson. Dr. Fergus proposed the toast of the President of the Medico-Chirurgical Society of Edinburgh, and paid a high tribute to the Medical School of Edinburgh, Prof. Caird replying.

ST. THOMAS'S HOSPITAL OLD STUDENTS' ANNUAL DINNER.—A happy re-union of old students of St. Thomas's Hospital and their friends took place at the Wharncliffe Rooms of the Hotel Great Central on Oct. 28th, Dr. H. W. G. Mackenzie presiding. The chairman proposed the toast of the evening, "St. Thomas's Hospital and its Medical School," coupled with the names of the Treasurer, Sir Arthur Stanley, and the Dean of the Medical School, Sir Cuthbert Wallace. He pointed out that the dinner marked the jubilee of the new St. Thomas's Hospital, which had arisen like a phœnix on the banks of the Thames and was opened by Queen Victoria in June, 1871. Dr. Mackenzie traced in brief outline the history of the hospital from the days before the Norman Conquest when a small convent was built on the banks of the Thames by a pious maiden from the proceeds of a ferry over the river, and he passed in review the great names associated with the institution. Dr. Mackenzie referred to the newly-instituted "unit system" as a great success; St. Thomas's, he said, was more than "unit-ed" it was united; for complete harmony existed among the staff, between the staff and the governing body, and, in fact, between all concerned in the organisation and management of the institution. In his reply, Sir Arthur Stanley spoke of the chairman's allusion to Mead, and said that from the time and trouble which that great physician spent on his patients he must have been the forerunner of the panel doctor. Sir Arthur Stanley said that he was an optimist in regard to the financial position of the hospital; he hoped that the money for the students' hostel would be soon forthcoming and that the sports ground at Chiswick would be permanently acquired for the present and future generations. Sir Cuthbert Wallace alluded to the present position of medical education, and spoke of the advantages which might be gained by the correlation of the curriculum of various universities. Dr. R. P. Smith proposed the health of the chairman in felicitous terms, and this was drunk with musical honours.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Unemployment and Health Insurance.

A BILL was introduced by Sir ALFRED MOND, Minister of Health, and read for the first time on Wednesday, Oct. 26th, entitled the National Health Insurance (Prolongation of Insurance) Bill. The measure extends temporarily the period during which persons who are unemployed may remain insured under the general provisions of the National Health Assurance Acts, 1911 to 1921.

HOUSE OF COMMONS.

WEDNESDAY, OCT. 26TH.

The Demolition of Slum Areas.

Major BARNES asked the Minister of Health whether any schemes had come before the Ministry for the demolition of slum areas in respect of which a special grant had been offered by the Government in the current year.—Sir A. MOND replied: In view of the necessity of concentration on the production of new houses, comparatively few proposals for the demolition of slum areas have been submitted. Definite schemes have been received in respect of 19 areas, while in a number of other cases informal proposals have been discussed with the local authorities. Four schemes have been confirmed or confirmation promised, of which one is the Brady-street scheme of the London County Council.

Infant Death-rates.

Dr. ADDISON asked the Minister of Health what the infant death-rate for London had been for each quarter of the present year up to the end of September, and what had been the corresponding rates for England and Wales.—Sir A. MOND replied: According to the Registrar-General's returns the figures are as follows:—

Deaths under 1 per 1000 Births, 1921.

	London.	England and Wales.
1st quarter	85	101
2nd ,, ...	59	67
3rd ,, ...	93	83

The excess of the London rate over the rate for England and Wales in the third quarter is mainly due to infantile diarrhœa which has, of course, a heavier incidence in towns than in the country as a whole.

Pure Lactose and Safeguarding of Industries Act.

Mr. LAMBERT asked the President of the Board of Trade if lactose is a dutiable article under the Safeguarding of Industries Act; if so, was he aware that lactose was used to prepare in this country reliable infant foods; and whether, in view of pledges given that food should not be taxed for what reason, since infant food manufactured abroad could be imported free, was the manufacturer of infant food in this country to be penalised by the taxation of an important ingredient in his product.—Mr. BRIDGEMAN replied: Crude lactose is not dutiable, but the purer qualities, such as those which fulfil the requirements of the British Pharmacopœia, are held to be dutiable under the Safeguarding of Industries Act, under the general heading of Fine Chemicals. I am aware that the purer qualities are used for the purpose described by my right hon. friend. The Board of Trade have no power to exclude on any ground from the operation of the Act any commodity properly included within the general headings of the Schedule. The question as to whether lactose is properly so included is a matter which can be referred to the referee to be appointed under Section I. (5) of the Act, and a complaint on the point is being referred accordingly.

Deaths from Disease in Mesopotamia.

Sir THOMAS POLSON asked the Secretary of State for the Colonies how many deaths from disease had occurred during the last six months among officers and men of the British forces stationed in Mesopotamia.—Mr. CHURCHILL replied: The figures are as follows: British forces under the War Office, 56; British forces under the Air Ministry, 7; Total deaths from disease, 63.

THURSDAY, OCT. 27TH.

Ex-Service Men in Lunatic Asylums.

Captain LOSEBY asked the Minister of Pensions the number of ex-Service men at present confined in lunatic asylums who were in receipt of treatment allowances.—Major TRYON replied: The number of ex-Service men classified as Service patients in respect of whom treatment allowances are paid or credited is 6435.

Tuberculous Gland Treatment by X Rays.

Lieut.-Colonel DALRYMPLE WHITE asked the President of the Board of Education whether, in view of the great superiority of the treatment of tuberculous glands by X rays over the former surgical treatment, he would reconsider his decision not to sanction any further treatment by X rays, at all events in such localities where there was a general hospital with X ray installation.—Mr. FISHER replied: I presume that the hon. and gallant Member has in view the limited experiment at Southport in this form of treatment which the Board sanctioned in October, 1919. I am advised that the results of that experiment are not such as to justify the Board in entertaining at present proposals for further expenditure on the continuance or extension of the experiment.

Appointments at Holloway Convicted Hospital.

Lieut.-Colonel Sir SAMUEL HOARE asked the Secretary for the Home Department whether a wardress with no nursing experience had recently been placed in charge of the convicted hospital at Holloway over the heads of five trained nurses; whether this appointment was made on the advice of the Voluntary Advisory Nursing Board; and who were the ladies and gentleman who constituted that board.—Mr. SHORTT replied: It is not the case that a wardress with no nursing experience has been placed in charge of the convicted hospital at Holloway. The officer selected has had much nursing experience as she had been engaged on hospital duties for 17 years, and was selected to be a hospital officer in 1913, since when she has been wholly employed on hospital work. She is reported by the medical officers to be fully qualified and very capable. The Voluntary Nursing Board was not consulted as to the appointment, nor have they made any representation on the matter. It consists of the Medical Commissioner (Chairman); Dame Sarah Swift; Miss Hogg, Matron of Guy's Hospital; Miss McIntosh, Matron of St. Bartholomew's Hospital; Jessie, Lady Camoys; Dr. Mary Scharlieb; Miss Edith Blunt; The Governor of Holloway Prison; and the Hospital Lady Superintendent of Holloway Prison.

Insurance Act Medical Records.

Sir J. D. REES asked the Minister of Health whether the decision that doctors under the National Insurance Act should keep elaborate records of the cases of their patients had been cancelled; and, if not, whether that decision would now be cancelled in view of the cost of maintaining such records and of the objection generally entertained to bureaucratic registration, and even possible disclosure of incidents in the private life of patients concerned.—Sir A. MOND replied: The keeping of records was one of the original conditions of the insurance medical service. The present system was recommended in 1920 by a special committee, mainly consisting of medical men, among whom insurance practitioners were strongly represented. The initial cost has already been met, and the cost of maintenance is small. Resolutions were passed only last week in favour of the keeping of records by the annual conferences of panel committees and insurance committees respectively. In these circumstances I see no reason for reversing the decision that records should be kept.

Regional Medical Officers.

Mr. SUGDEN asked the Minister of Health what the cost had been in salaries, also expenses for travelling, of the officers and insured persons concerned, rent of premises, clerical assistance, &c., of the regional medical officers appointed by the Ministry of Health Act, 1920.—Sir A. MOND replied: The answer to the question is as follows: Salaries, full-time medical officers, £11,918 6*s.* 3*d.*; fees to part-time officers, £58 16*s.* Travelling expenses, officers and clerks, £1572 13*s.* 5*d.*; insured persons, £646 12*s.* 5*d.* Rent, offices, £2001. Part-time examination centres and women attendants, £2202 9*s.* 4*d.* Clerical assistance, &c., £7689 Incidental expenses (equipment, &c.), £819 18*s.* 6*d.* Total, £59,908 15*s.* 11*d.*

Mr. SUGDEN asked the Minister of Health how many cases examined had been referred to the regional medical officers by the panel doctors of insured persons concerned for assistance in treatment by consultation, and how many by the Friendly or Approved Societies and doctors for the purpose of deciding as to the fitness of the patient to return to work.—Sir A. MOND replied: The provision at present made in regard to the duties of the regional medical staff does not include the routine examination of cases of the kind referred to in the first part of the question. I would remind my hon. friend that Approved Societies and doctors were notified at the commencement of the service in November, 1920, that for an experimental period incapacity references only would be accepted. In reply to the second part of the question the aggregate number of references from Approved Societies, doctors, and insurance committees on questions of doubt as to incapacity for work for the period Nov. 1st, 1920, to Oct. 1st, 1921, was 50,318.

Women Visitors of Lunatic Asylums.

Viscount WOLMER asked the Secretary for the Home Department whether there were any women visitors of

lunatic asylums, and whether the supervision of female lunatics was conducted by men or by women.—Sir A. MOND replied: The answer to the first part of the question is in the affirmative. As regards the second part all the attendants and nurses for female patients are women.

Proposed Registration of Herbalists.

Lieut.-Commander KENWORTHY asked the Minister of Health whether His Majesty's Government contemplated any steps for the better regulation and registration of herbalists on the lines of the recent Dentists Act.—Sir A. MOND replied: The answer is in the negative.

FRIDAY, OCT. 28TH.

Lapsed Insurance Contributions.

Sir A. MOND (Minister of Health), in moving the second reading of the National Health Insurance (Prolongation of Insurance) Bill, explained that its object was to keep in benefit a large section of contributors to Approved Societies who, owing to unemployment, had lapsed. The subscribers would be credited with contributions for a certain number of weeks, the cost falling on the Approved Societies. There would be no charge on the State.

The Bill was read a second time.

MONDAY, OCT. 31ST.

The Territorial Voluntary Aid Detachment.

Lieut.-Colonel PINKHAM asked the Secretary for War what progress was being made with the Territorial Voluntary Aid Detachment scheme; how soon would the actual conditions of service and establishment be determined; and was he aware that at the present moment the existing detachments were rapidly dwindling, whilst others had been or were being disbanded owing to lack of any definite rules and regulations, the temporary rules sent out not meeting the case.—Sir LAMING WORTHINGTON EVANS replied: The Army Council have approved the principles of a new scheme, the details of which are to be considered by a committee on which the British Red Cross Society and other authorities concerned will be represented. In regard to the last part of the question, so far as I am aware there has been since Jan. 1st last a net reduction of 21 detachments only out of a total of 4037.

Taxation of Lactose.

Mr. LAMBERT asked the President of the Board of Trade why, seeing that the Board of Trade under the Safeguarding of Industries Act was not permitted to tax food, lactose or milk sugar, an important ingredient in the manufacture of infant food, had been scheduled for taxation.—Mr. BALDWIN replied: Articles of food or drink are expressly excepted only from the operation of Part II. of the Safeguarding of Industries Act, and not from Part I., under which lactose of a certain grade and purity is dutiable.

Proposed Drawback on Hospital Chemicals.

Dr. MURRAY asked the President of the Board of Trade whether he was aware that a large number of proprietary articles of continental origin included in the Key Industries Schedule of the Safeguarding of Industries Act were used by hospitals, and that, owing to the duty now imposed, these hospitals would have to pay much higher prices; and whether he was prepared to allow a drawback to these hospitals on such medical chemicals, in view of the low state of the finances of these institutions.—Mr. STANLEY BALDWIN replied: A number of the commodities covered by the general chemical heading of the schedule to the Safeguarding of Industries Act are, no doubt, of the kind stated by the hon. Member. The experience of the war years showed, however, the grave danger of dependence upon foreign sources for important medical supplies, and the need of action to prevent so far as possible its recurrence; and I am not prepared to introduce the legislation necessary to give effect to the hon. Member's suggestion.

The Government Grant to Voluntary Hospitals.

Mr. LEONARD LYLE asked the Minister of Health whether the Government still adhered to its promise, arising out of the Cave Committee's Report, to allocate £500,000 to the voluntary hospitals; what steps in that case had been taken towards the allocation of the fund; within what period was it intended it should be allocated; and whether in each case a stipulation was to be attached to the effect that before a hospital could receive a grant it must put up a sum equal to the grant made up of new money.—Sir A. MOND replied: The grant of £500,000 towards the liquidation of the voluntary hospital deficits was voted by the House last August. The Voluntary Hospitals Commission are taking steps to establish local hospital committees on the lines recommended in Lord Cave's Report, and it is hoped that the personnel of a number of these committees will be complete within the next few weeks. King Edward's Fund, who act as the local committee for London, have made considerable progress with their work, and emergency grants will be distributed at an early date to the most necessitous of the metropolitan hospitals. I am informed that it is not anticipated that the full amount of the grant will be spent during the current financial year, and an estimate will be submitted to the House next session for a re-vote of the unexpended balance. As regards the conditions attaching to the grant I would refer my hon. friend to the White Paper (Cmd. 1402) which was circulated in July.

The Spahlinger Treatment of Tuberculosis.

Sir CLEMENT KINLOCH-COOKE asked the Minister of Health whether any further investigation had been made in the matter of the Spahlinger treatment for tuberculosis; and when it was likely the treatment would be available for patients suffering from this disease.—Sir A. MOND replied: I understand that certain unofficial investigations have been made in this matter, but that no definite conclusions have been arrived at. As I have already stated, it will not be possible to undertake any independent investigation as to the efficacy of the Spahlinger treatment which is essential in a matter of this importance until supplies of the serum are available in this country. I understand that such supplies are not yet forthcoming.

TUESDAY, NOV. 1ST.

Ex-soldiers and Tuberculosis.

Mr. SITCH asked the Minister of Pensions the number of applications for pensions received from ex-soldiers suffering from tuberculosis; the number of awards conferred on cases of such disability certified as resulting from service with His Majesty's forces; and the number of cases of tuberculosis not so certified or accepted as being due to service during the war.—Major TRYON replied: The records of the Ministry are not kept in such form as to enable a complete answer to be given to this question without a very considerable amount of research which my right hon. friend is not prepared to impose on his staff. I can, however, inform my hon. friend that during the past 18 months 6500 awards were made in respect of tuberculosis; but as rejections are not classified according to diseases, I am unable to state the number of claims in respect of tuberculosis which were not accepted during that period.

The Services.

ROYAL ARMY MEDICAL CORPS.

Temp. Capt. J. A. Marsden to be temp. Maj. whilst empld. as Dep. Asst. Dir. of Hygiene.

Capt. J. E. Brooks is secd. for service under the Colonial Office.

Capt. T. Young relinquishes the actg. rank of Maj.

The undermentioned temp. Capts. relinquish their commns., and retain the rank of Capt.: R. E. Smith and J. M. Browne.

Capt. W. McM. Chesney retires receiving a gratuity, and is granted the rank of Maj.

2nd Life Guards.—Surg. Lt.-Col. J. H. Power retires on ret. pay.

ARMY DENTAL CORPS.

Capt. D. Blair to be Maj.

Temp. Capt. A. McCormack, Dental Surg., from Spec. List, to be Lt., and to be temp. Capt.

OVERSEA FORCES.

S. Afr. Med. Corps.—Temp. Capt. L. W. Blazey, Dental Surg., relinquishes his commn. on completion of service, and retains the rank of Capt.

REGULAR ARMY RESERVE OF OFFICERS.

The undermentioned, having attained the age limit of liability to recall, cease to belong to the Res. of Officers:—

Army Medical Service.

Maj.-Gens.: Sir W. W. Pike, Sir H. N. Thompson, L. E. Anderson, S. Macdonald, and W. T. Swan.

Cols.: A. J. Luther, C. W. R. Healy, F. W. Begbie, S. F. Clark, W. L. Gray, and H. N. Dunn.

Royal Army Medical Corps.

Lt.-Cols.: N. Tyacke, C. A. Stone, H. W. H. O'Reilly, and D. Lawson.

Majs.: A. Pearse, Bt. Lt.-Col. F. J. Brown, R. F. E. Austin, and T. J. Lenehan.

Capt. J. M. Darling to be Maj.

TERRITORIAL ARMY.

Maj. (Bt. Lt.-Col.) E. S. Forde resigns his commn. and retains his rank with permission to wear the prescribed uniform.

Majs. W. H. Rowell and J. D. C. Swan resign their commns. and retain the rank of Maj.

Capt. W. C. Gunn to be Maj., and to commd. 5th (Scottish) San. Co.

Capt. H. N. Goode to be Maj., and to commd. 6th (Northern) San. Co.

Maj. J. D. Hart (late R.A.M.C.) to be Capt., and relinquishes the rank of Maj.

Lt.-Col. E. G. Peck, having attained the age limit, is retired, and retains the rank of Lt.-Col., with permission to wear the prescribed uniform.

Maj. W. A. Taylor, having attained the age limit, is retired, and retains the rank of Maj., with permission to wear the prescribed uniform.

Capts. F. Rowland, J. Anderson, J. McGlashan, and C. C. Grummitt, having attained the age limit, are retired, and retain the rank of Capt.

Supernumerary for Service with O.T.C.—Capt. E. W. A. Walker, having attained the age limit, is retired, and retains the rank of Capt.

TERRITORIAL ARMY RESERVE.

Col. R. Jackson, having attained the age limit, is retired, and retains the rank of Col., with permission to wear the prescribed uniform.

Capt. A. J. Williamson, from Genl. List, to be Lt.-Col.

Capt. S. S. Greaves, from Genl. List, to be Maj.

Capt. S. G. Reed, from 2nd Lond. San. Co., to be Capt.

ROYAL AIR FORCE.

Medical Branch.—Flight-Lt. A. Parker relinquishes his temporary commn. on ceasing to be employed, and is permitted to retain the rank of Capt.

Flight-Lt. (Hon. Squadron Leader) J. Keenan relinquishes his temporary commn. on ceasing to be employed, and is granted the rank of Maj.

Dental Branch.—The undermentioned Flight-Lts. are transferred to the Army Dental Corps (and will receive all emoluments from Army funds), with effect from the dates indicated. They will continue to hold their temporary R.A.F. commns. while attached to the R.A.F.: Actg. Squadron Leader C. L. Colbran and D. Blair.

INDIA AND THE INDIAN MEDICAL SERVICE.

Majs. A. E. J. Lister, T. S. B. Williams (Bt. Lt.-Col.), S. H. L. Abbott (actg. Lt.-Col.), J. E. Clements, H. B. Steen, E. Bisset, A. W. Overbeck-Wright, J. W. McCoy, R. M. Carter (Bt. Lt.-Col.), T. G. F. Paterson (Bt. Lt.-Col.), D. G. R. S. Baker, J. R. J. Tyrrell, Dewan Ganpat Rai, R. M. Barron (Bt. Lt.-Col.), W. R. J. Scroggie, T. H. Gloster, and H. H. G. Knapp to be Lt.-Cols.

Lt.-Col. L. J. M. Deas, on return from leave, has been posted as Agency Surgeon, Kotah. Maj. A. D. White has been permanently posted to Education Department, Bengal. Maj. J. E. Clements, on return from leave, has assumed the appointment of Medical Superintendent, Central Jail, Agra. Maj. J. H. Murray, C.I.E., has handed over the appointment of superintendent, Central Jail, Lahore. Maj. H. W. Acton has been posted to School of Tropical Medicine and Hygiene, Calcutta. Maj. H. H. King has been granted a year's leave. Maj. A. F. Hamilton has been appointed Professor of Midwifery, Grant Medical College, Bombay, and Physician, Bai Motlibai and Peti. Hospitals, vice Lt.-Col. S. C. Evans retired. Maj. D. P. Goil has been transferred from Murshedabad to Rajshahi. Maj. S. C. Chakrabatty, superintendent Central Lunatic Asylum, Berhampore, acts as Civil Surgeon, Murshedabad, in addition to his other duties. Maj. H. Watts, officiating civil surgeon, Sangor, has been appointed to executive and medical charge of Sangor District Jail. Maj. L. B. Scott, civil surgeon, Shillong, has been granted a year's leave.

METEOROLOGICAL CONDITIONS AND DISEASE.—A general meeting of the Association of Economic Biologists will be held on Friday, Nov. 11th, at 2.30 P.M., in the Botanical Lecture Theatre of the Imperial College of Science, South Kensington, London, S.W., when Dr. E. J. Butler, director of the Imperial Bureau of Mycology, will open a discussion on Meteorological Conditions and Disease.

NORTH ORMESBY HOSPITAL.—A new X ray department was opened recently at the North Ormesby Hospital, Middlesbrough, by Mr. J. H. Amos, manager of the Tees Conservancy Board, who raised practically the whole cost of the installation—namely, £1200. Acknowledging a vote of thanks, Mr. Amos stated that the hospital's annual income of about £17,000 came for the most part from the employers of labour and the working men in the area. Unlike most institutions of the kind, they were free from financial worries. The hospital was a household word in the district for homely comfort.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY, Nov. 10th.—List of probable papers:—A. J. Wilmott: Experimental Researches on Vegetable Assimilation and Respiration. XIV. Assimilation by Submerged Water Plants in Dilute Solutions of Bicarbonates and of Acids: an Improved Bubble Counting Technique (communicated by Dr. F. F. Blackman, F.R.S.). E. G. Young: The Coagulation of Protein by Sunlight (communicated by Prof. F. G. Hopkins, F.R.S.). E. G. Young: On the Optical Rotatory Power of Crystalline Ovalbumin and Serum Albumin (communicated by Prof. F. G. Hopkins, F.R.S.). A. R. Ling and D. R. Nanji: On the Longevity of Certain Species of Yeast (communicated by Sir E. Thorpe, F.R.S.). F. Kidd, C. West, and G. E. Briggs: A Quantitative Analysis of the Growth of *Helianthus Annuus*. Part I. The Respiration of the Plant and of its Parts throughout the Life Cycle (communicated by Dr F. F. Blackman, F.R.S.). G. S. Currey: The Colouring Matter of Red Roses (communicated by Prof. F. Keeble, F.R.S.).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Nov. 8th.

THERAPEUTICS AND PHARMACOLOGY: at 4.30 P.M.
Presidential Address by Dr. W. Langdon Brown: The Threshold of the Kidney. (Discussion is invited.)

PSYCHIATRY: at 8.30 P.M.
Paper:—Sir Frederick Mott: Further Researches upon the Reproductive Organs in Dementia Præcox.

Wednesday, Nov. 9th.

SURGERY: SUB-SECTION OF PROCTOLOGY: at 5.30 P.M. The President will raise for informal discussion some topics of interest to the Sub-Section.
Cases also will be shown.

Thursday, Nov. 10th.

NEUROLOGY: at 8.30 P.M.
Discussion:—The Treatment of Persistent Pain due to Lesions of the Central and Peripheral Nervous System (introduced by Sir William Thorburn and Dr. Wilfred Harris).

SURGERY: Members of the Surgical Section are invited to join in the above discussion.

Friday, Nov. 11th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.).
Exhibition of Cases.

OPHTHALMOLOGY: at 8.30 P.M.
Papers:—Dr. W. S. Inman: The Relationship of Squint, Lefthandedness, and Stammering.
Dr. Charles F. Harford: The New Psychology and its Relation to Problems of Vision.

HARVEIAN SOCIETY OF LONDON, Town Hall, Paddington Green, Harrow-road, W.
THURSDAY, Nov. 10th.—8.30 P.M. *Paper:*—Dr. G. A. H. Barton: Ether: Some Simple Methods and Musings.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY, Nov. 9th.—8 P.M., Mr. D. R. Wilson, Secretary of the Industrial Fatigue Research Board: The Work of the Industrial Fatigue Research Board and its Applications to Industry.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
Museum Demonstrations in the Theatre of the College for Advanced Students and Medical Practitioners:—
MONDAY, Nov. 7th.—5 P.M., Prof. S. G. Shattock: Cysts.
FRIDAY.—5 P.M., Sir Arthur Keith: Recently added Specimens of Clinical and Anatomical Interest.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.
TUESDAY, Nov. 8th and THURSDAY.—5 P.M., Fitz-Patrick Lectures:—Dr. R. O. Moon: Hippocrates in Relation to the Philosophy of his Time.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Nov. 7th.—2.30 P.M., Dr. Arthur Saunders: Demonstration of Cases in Medical Wards. 5 P.M., Dr. Donald Armour: Practical Surgery (Lecture III.).
TUESDAY.—10 A.M., Mr. Steadman: Dental Department. 5 P.M., Mr. Banks Davis: Nasal Deafness. Lecture.
WEDNESDAY.—2 P.M., Dr. Burnford: Visit to Medical Wards. 5 P.M., Mr. Simmonds: Surgical Emergencies (Lecture II.).
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 5 P.M., Mr. Donald Armour: Practical Surgery (Lecture IV.).
FRIDAY.—11 A.M., Dr. McDougal: Electrical Department. 5 P.M., Mr. MacDonald: Cystitis. Lecture.
SATURDAY.—10 A.M., Dr. Arthur Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients.
Daily:—10 A.M., Visit of Post-Graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W.

MONDAY, Nov. 7.—11 A.M., Dr. Goodall: Out-patients. 2 P.M., Dr. Moon: In-patients. 5.30 P.M., Lecture:—Dr. J. S. Goodall: Extra Systoles and their Significance.

TUESDAY.—10 A.M., Dr. Parsons-Smith: Out-patients. 10 A.M., Dr. Price: In-patients. 2 P.M., Sir S. Russell-Wells: Out-patients.

WEDNESDAY.—10 A.M., Dr. Parkinson, and 2 P.M., Dr. Moon: Out-patients.

THURSDAY.—2 P.M., Dr. Price: Out-patients. Dr. Moon: In-patients. 6.30 P.M., Dr. Hamill: Out-patients.

FRIDAY.—10 A.M., Dr. Parsons-Smith: Out-patients 2 P.M., Dr. Parkinson: Out-patients. 3 P.M., Dr. Parkinson: In-patients. 4 P.M., Dr. Goodall: In-patients.

SATURDAY.—10.30 A.M., Dr. Hamill: In-patients.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 10th.—4 P.M., Lecture:—Mr. L. E. Barrington-Ward: The Management of Acute Abdominal Conditions.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

THURSDAY, Nov. 10th.—6 P.M., Chesterfield Lecture:—Dr. J. L. Bunch: Pruritus and Itching Diseases of the Skin.

ST. MARYLEBONE GENERAL DISPENSARY, 77, Welbeck-street, Cavendish-square, W.

Post-Graduate Course on Infant and Child Welfare.

A Course of Twelve Lectures on the Management and Feeding of Infants and Young Children, by Dr. E. Pritchard, to Qualified Practitioners.

WEDNESDAY, Nov. 9th.—6 P.M., Lecture XI.:—Rickets, Causes, Symptoms, and Treatment.

FRIDAY.—6 P.M., Lecture XII.:—The Feeding of Children between Nine Months and Two Years.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.

TUESDAY, Nov. 8th.—4.30 P.M., Mr. W. F. Shaw: Urinary Symptoms in Gynæcology.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURES, Whitworth-street, West Branch, Manchester.

FRIDAY, Nov. 11th.—4.30 P.M., Dr. Fothergill: Pelvic Varicocele.

ANCOATS HOSPITAL.

THURSDAY, Nov. 10th.—4.30 P.M., Dr. G. Langley: The Significance and Treatment of the Irregular Pulse.

UNIVERSITY OF SHEFFIELD.—FACULTY OF MEDICINE.

Post-Graduate Lectures and Demonstrations.

TUESDAY, Nov. 8th. (At the Jessop Hospital).—3.30 P.M., Mr. W. W. King: Demonstration of Gynæcological Cases.

FRIDAY. (At the Jessop Hospital).—3.30 P.M., Prof. M. H. Phillips: Demonstration of Gynæcological Cases.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.

A Course of Eight Lectures and Discussions on Problems of Public Health in Relation to Industrial Hygiene at the Lecture Theatre of the Institute.

WEDNESDAY, Nov. 9th.—4 P.M., Lecture IV.: Prof. L. McIlroy: The Problem of the Working Mother.

Appointments

BORTHWICK, G. A., M.B., Ch.B. Edin., has been appointed Assistant Medical Officer of Health and Assistant School Medical Officer for Barnsley.

SIMPSON, KERR, M.D., Ch.B. Edin., D.P.H., Deputy Medical Officer of Health and School Medical Officer for Croydon.

Certifying Surgeons under the Factory and Workshop Acts.—DWYER, M., L.R.C.P.Lond., M.R.C.S.(Tattenhall): ALLAN, J. G., M.B., Ch.B.Edin. (Catrine); WALL, D., M.B., Ch.B. Edin. (Hoo, Kent); PIRIE, A. W. R., M.B., Ch.B.Aberd. (Preston).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen, Royal Hospital for Sick Children.—Hon. S.
Bedford County Hospital.—Asst. H.S. £150.
Birkenhead Borough Hospital.—Jun. H.S. £200.
Bristol General Hospital.—Cas. H.S. £175.
Bury Infirmary.—Junior H.S. £150.
Camberwell Infirmary.—Jun. Asst. M.O. £350.
Cambridge, John Bennett Clinical Laboratory.—Clin. Path. £300.
Cape Town University.—Lectureships. £450 and £400.
Cardiff, University of South Wales and Monmouthshire.—Lecturer in Path. and Bact. £750.
City of London Hospital for Diseases of the Chest.—Half-time M.O.
Coulsdon, Netherne Mental Hospital.—Two Asst. M.O.'s. £400 to £500.
Dumfries, Crichton Royal Mental Hospital.—Clin. Pathologist. £400.
Durham County Council.—Asst. Welfare M.O. £600.
East London Hospital for Children, &c., Shadwell, E.—H.S. £125.
Epsom Manor Certified Institution.—Asst. M.O. £400.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Asst. H.S. £150.
Great Northern Central Hospital, Holloway-road, N.—Two P.'s.
Grimsby and District Hospital.—R.H.S. £300.
Hull Royal Infirmary.—Hon. Pathologist.
Kensington Dispensary and Children's Hospital, 49, Church-street, W.—Hon. Dent. S.
Kensington and Fulham Hospital. Hon. P.
London Fever Hospital, Islington, N.—Res. M.O. £500.
Manchester Royal Infirmary.—Res. M.O. £250.
Manchester, St. Mary's Hospitals for Women, &c.—Two H.S.'s. Each £100.
Middlesbrough, North Riding Infirmary.—Sen. H.S. and Jun. H.S. £200 and £150.
Mothers' Hospital, Lower Clapton-road, E.—Res. M.O.
Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £200.
Nottingham General Hospital.—H.S. £200.
Portsmouth Royal Hospital.—Third H.S. £150.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Sen. Res. M.O. £100. Asst. Res. M.O. £60. District Res. M.O. £80.
Royal Dental Hospital, Leicester-square.—House Anæsth. 10s. 6d. each Attendance.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—Hon. Asst. S.
Royal Naval Medical Service.—Surg. Lieuts.
Royal Sea Bathing Hospital, Margate.—S. £200.
St. Mary's Hospital, Paddington.—Med. Supt. £350.
South Eastern Hospital for Children, Sydenham, S.E.—Res. M.O. £100.
Sunderland Royal Infirmary.—H.S. £200.
Ventnor, Royal National Hospital for Consumption.—Asst. Res. M.O. £300.
Virginia Water, Surrey, Holloway Sanatorium.—Jun. Asst. M.O. £400.
Warwickshire County Council.—Asst. M.O.H. £550.
West London Hospital, Hammersmith-road, W.—Hon. Surg. Registrar.
Western Ophthalmic Hospital, Marylebone-road.—Hon. Radiologist amd Hon. Asst. Anæsth.
Winchester, Royal Hampshire County Hospital.—H.S. £150.
Wokingham, Berks, Pinewood.—Med. Supt. £600.
Worcester General Infirmary.—Res. M.O. £200.

Births, Marriages, and Deaths.

BIRTHS.

BERNARD.—On Oct. 24th, at Lower Stone-street, Maidstone, the wife of Dr. E. A Bernard, of a daughter.

FENTON.—On Oct. 24th, at Farfield House, Kidderminster, the wife of V. N. Fenton, M.B., B.Ch.Cantab., of a son.

SMALLEY.—On Oct. 29th, at a nursing home, Manchester, the wife of Major J. Smalley, I.M.S., of a son.

MARRIAGES.

MORTON—DOBIE.—On Oct. 24th, in London, Flight-Lieut. T. C. Morton, M.B., D.T.M., R.A.F.M.S., to Emily Frances, eldest daughter of D. Robertson Dobie, M.D., F.R.C.S., Crieff, Scotland.

DEATHS.

BAINBRIDGE.—On Oct. 27th, at Clarence Gate-gardens, Regent's Park, Dr. Francis Arthur Bainbridge, F.R.S., F.R.C.P., aged 47 years.

BEAUMONT.—On Oct. 28th, suddenly, at Charing Cross Hospital, Edgar Beaumont, M.D., of Montague House, Upper Norwood.

BROCKATT.—On Oct. 24th, in London, Andrew Alexander Brockatt, M.D., lately of Great Malvern, in his 58th year.

GARDINER.—On Oct. 28th, suddenly, at his residence, the Old Court House, Richmond, Surrey, Matthew Henry Gardiner, M.B., C.M. (Edin.), aged 64 years.

ROLSTON.—On Oct. 27th, at Glen Maye, Yelverton, Devon, George Theodotus Rolston, J.P., L.R.C.S., L.S.A., late of Stoke, Devonport, aged 91 years.

WICKHAM LEGG.—On Oct. 28th, at Woodstock-road, Oxford, John Wickham Legg, Hon. D.Litt. Oxon., F.R.C.P. Lond., aged 77 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

PRESENTATION TO A MEDICAL MAN.—Dr. T. P. Stewart, of Newport, Fifeshire, has recently been presented with a complimentary letter bearing the names of 600 friends and patients, as well as a silver salver and a cheque for £1400, "as a token of affectionate regard and grateful thanks for his 31 years skilful, generous, and self-sacrificing service."

WARNEFORD HOSPITAL, LEAMINGTON.—The new out-patients wing of this hospital, erected at a cost of £25,000, was opened on Oct. 26th by Princess Helena Victoria. Dr. Bernard Rice, consulting surgeon to the hospital, said that last year there were 37,000 attendances in the out-patient department, and although the hospital had been losing something like £2000 a year the committee felt that they must maintain a hospital which had existed on a voluntary basis for 90 years. At the reception held in the afternoon purses were received containing about £2500.

Notes, Short Comments, and Answers to Correspondents.

RAT WEEK, 1921.

In connexion with the Rat Week fixed by the Ministry of Health for the week Oct. 31st to Nov. 5th a popular lecture on the Rat Problem was given on Oct. 28th at the Institute of Hygiene by Dr. C. W. Hutt, medical officer of health for Holborn. He explained that one object of the Ministry of Health in arranging the rat week was to endeavour to arrange that everybody should make concerted efforts to destroy rats and that rats should not be merely driven from one place to another. The only good point the rat has is that he preys on mice and keeps the number under. If we kill rats we must kill mice, otherwise the mice would find the struggle for existence less severe and multiply up to the extent of the food-supply. South Australia and Victoria recently suffered from a mouse plague which destroyed the wheat and hay, while horses fed on contaminated hay generally died.

Rats carry disease germs and spread disease to valuable domestic animals and man. Horse influenza is spread from stable to stable by rats. Where the outbreak of the disease has led to the closing of a stable the disease promptly appears in other stables in consequence of the migration of the rats as soon as their food-supply is stopped. Foot-and-mouth disease is carried by rats; pigs contract trichinosis by eating infected rats. At the Glasgow abattoirs it has been shown that 3 per cent. of the rats were suffering from trichinosis. More important still is probably the cause of meat poisoning, which is now known to be due to the pollution of raw and cooked meat with bacilli of the Gaertner group. The most dramatic of the hygienic dangers due to rats is the ever-present possibility of the spread of plague by their agency. Great as is the hygienic danger from rats the economic loss is even more appalling; it is estimated that at least £50,000,000 (fifty million pounds) worth of damage is caused every year in this country by rats alone. The damage done to the farmer is often equal to his rent and rates combined. The rat, like other rodents, must keep his incisor teeth from growing; to maintain them at the proper length he has to gnaw hard substances. He burrows under foundations, through walls, and by biting his way through joists at times causes the collapse of buildings. To free premises from rats the first matter to receive attention must be the prevention of the access of any more rats. Any defective house drain allowing an unobstructed passage from the sewer to the house must be remedied; all other possible entrances must be guarded by wire netting or metal guards. In the case of the black rat—a Blondin among rats—any means of access to the higher floors must also be blocked. This rat often gains access to the refreshment kitchens of city firms on the upper floor by running along telephone wires.

The cheapest way to destroy rats is by poison; the safest poisons to use are barium carbonate and liquid extract of squills; traps should be used after a poisoning campaign and in the winter, but they must be used with skill. The rat has the largest brain in proportion to its size of any mammal, and the trapper has to use all his ingenuity. The experience in Holborn is that the handling of a trap by a human being does not stop a rat from entering it. The Ministry of Health, Dr. Hutt concluded, should allow local authorities to spend a moderate sum on the purchase and free distribution of rat poisons, and as in the parallel instance of infectious diseases encourage the building up by public health committees of a more or less complete organisation to cope with this source of danger and loss to the community.

THE FOOD VALUE OF WHITE FLOUR.

We have received from the hon. secretary of the Bread and Food Reform League some comments upon the official memorandum on Diet in Relation to Normal Nutrition, the subject of an annotation in last week's issue. The League would have liked to see more attention directed to the mineral content of oatmeal and whole wheatmeal. We alluded then, as on many previous occasions, to the danger arising from the milling of cereals. The energy requirements of the body vary from 2750 to 5500 calories per day according to the work of the individual. They are mainly satisfied by fat and carbohydrate in the proportion of 90 g. of fat to 550 g. of carbohydrate. Carbohydrate is chiefly consumed in the form of starch from white wheat flour in bread, cakes, pastry, &c.; the average quantity eaten per day may be reckoned as 2 lb. of bread, which furnish 2000 of the necessary calories. Proteins, salts, and vitamins are the other essential constituents of the diet. The protein and salt requirements are easily satisfied by the ordinary mixed food, but such food may not supply the vitamin requirement. Like proteins, definite amounts of each vitamin are required daily to keep the body in perfect health, but as yet the amounts have not been determined. The germ and outer portions of the cereal grains supply B-vitamin, the absence of which from the food leads to beri-beri, as has been clearly demonstrated both in the case of polished rice and white wheaten flour. Seeds of grains and legumes are the natural foods richest in B-vitamin. The milling processes remove the B-factor from the grain, and its loss is not easily made good by the other articles in the diet of the poorer classes. Flesh and fish are poor in respect of this vitamin, eggs are good, and so are most fruits and vegetables; yeast contains this vitamin in considerable amount. The addition of yeast to flour in the making of bread does not compensate for the vitamin lost in milling. No attempt is made to compensate for it in making cakes, &c., for which baking powder is used. Milk is variable in its vitamin content, and can hardly be considered as rich in B-factor. The loss of B-factor from the grain will only be replaced if eggs and large quantities of vegetables and fruits are eaten. As B-vitamin is a highly important constituent of the food, and is only amply supplied by the germ and outer parts of cereal grains, health is not promoted by the preference of the population for white flour. Whiteness does not represent goodness. The people should be encouraged to eat wholemeal flour, which can be obtained finely ground, so that they get a proper supply of B-vitamin. Highly milled flour is also deprived of good protein, A-vitamin, and salts. It is of special importance that patent cereal foods for infants should be prepared from the whole grain.

THE GLOVED HAND.

An article in the September number of the *American Journal of Clinical Medicine* entitled "The Passing of the Rubber Glove," suggests that some American surgeons find that gloves render large incisions and multiple adhesions unavoidable, because of the marked diminution of tactile sensibility which they entail. In preference, preparation of the hands with Dakin's water-soluble chloramine soap is recommended, and a subsequent coating of varnish. It is difficult to appreciate the advantages of varnish over gloves, and multiple adhesions are more liable to follow button-hole incisions than a proper technical exposure. The crux of the matter remains—can hands be sterilised by washing? The evidence appears to show that while a temporary sterilisation may be possible the secretion of sweat glands soon floods the surface with cocci hidden in the ducts and other crypts in the skin. But the suggestion that the rubber glove is more trouble than it is worth may do good in stimulating glove manufacturers to produce a more durable brand.

THE COST OF CLEAN STREETS.

To keep Manchester "clean" involved last year an expenditure of £481,096, against an income of £109,247, while in 1914 the corresponding cost was £145,645—the increase being due chiefly to cost of labour and materials. The cleansing department of the city has a staff of 1656 employees, who have to look after 616½ miles of streets within the city. Over 1000 tons of refuse were disposed of every week-day, and the total amount exceeded 307,490 tons. Something like 2,168,600 tons of this refuse have been deposited on the Carrington and Chat Moss Estates—the property of the city—with the result that the moss land has been completely reclaimed; and owing to this and other factors the market value of this moss area has been greatly enhanced. There are now over 50 farmsteads on what was previously moss land, while the raw peat itself is used for bedding of horses and the manufacture of bacterised peat.

CONGENITAL HEART BLOCK.

Authentic instances of this condition being rare in medical literature, interest attaches to a unique case recently recorded by Drs. P. D. White, R. S. Eustis, and W. J. Kerr,[1] in which the irregular pulse was observed before birth and verified by the electrocardiograph on the fourth day after birth. The case was that of a Mongolian idiot whose fœtal heart rate was found to be markedly irregular. On the second day after birth the pulse showed variations between a regular rate of 80, a bigeminal rhythm of 105, a trigeminal rhythm of 120, and a rapid regular rate of 160. On the fourth day electrocardiograms showed partial heart block and evidence of right ventricular preponderance, succeeding examinations at two and half, five, and eight months suggesting that the partial heart block was paroxysmal. The anatomical defects were probably a patent ductus arteriosus with the usual interventricular septum defect The authors describe a second case of complete heart block in a child of 5½ years, the congenital origin of which is strongly suggested by the age of the child and the absence of a history of severe diphtheritic infection. These two new cases are discussed in detail and correlated with the ten other cases found in the literature, in all but two of which the block was complete.

[1] American Journal of Diseases of Children, September, 1921.

THE LIFE OF THE HOUSE-FLY IN WINTER.

IN the July number of the *Japan Medical World*, Dr. Harujiro Kobayashi, Sc.D., of the Chosen Government Hospital, Seoul, Korea, describes an investigation into the problem of the wintering of *Musca domestica*. Various claims have been made by writers on the subject to the effect that the fly passes the winter only in the adult stage, or only in the larval or pupal stage; but Dr. Kobayashi points out that the finding of any form does not necessarily imply wintering, since places have been noted where flies breed even in mid-winter. As a result of laboratory experiments and observation under natural conditions, Dr. Kobayashi has arrived at the following conclusions: (1) Certain species of *Musca domestica*, principally the female, "overwinter" in the adult stage in Korea. These flies are not in a state of hibernation, as active movement and oviposition occur from time to time. (2) In Seoul there are probably certain places where continual breeding of flies occurs in the winter. (3) No exact confirmation of the "overwintering" of larvæ and pupæ of the house-fly in Seoul has been obtained. (4) By experiments in feeding of the adult house-fly its longevity seems to be above 120 days in the winter. (5) *Scatophaga stercolaria* and *Calliphora lata* may also live through the winter in the adult stage. (6) *Stomoxys calcitrans*, *Sarcophaga carnaria*, and several other types apparently winter in the pupal or larval stages. (7) The destruction of wintering adults and detection of breeding-places in the winter must effectively counter the prevalence of the house-fly in the hot season.

COLONIAL HEALTH REPORTS.

East Africa Protectorate.—A belated report for 1918-19 contains some interesting passages relating to the public health. The general health of all sections of the community during the year was exceptionally bad. There was a considerable addition to the number of cases treated, which, even allowing for the normal rise in attendance at hospitals consequent on the development of the country, was much above the average. The mortality was abnormal, due to a variety of explainable causes which could not be controlled. The effect of the year's work was further reflected in the increase of the invaliding rate amongst the official class. Stoppage of leave, the withdrawal of every available man either from his billet here or who might have been selected to fill that post from home, resulted in the retention of an understaffed, overtaxed body of war-stale Government servants to carry on the administration of the country. Briefly the adverse conditions were the universal drought throughout the greater part of the year, due to the failure of both rains, and the consequent famine conditions, which greatly stimulated the continued existence of the usual communicable diseases. It became apparent that the return of large numbers of discharged soldiers and Carrier Corps porters had, and is having, its inevitable effect on the country; this, in spite of the most admirable efforts of the medical staff of the Carrier Corps. It was not possible for the civil department to take over the segregation of disease "carriers." Thus it was that various diseases became especially prevalent. The rapid spread of tuberculosis is becoming a serious menace. Equally with the rest of the world, this Protectorate was devastated by influenza, which swept like a tidal wave to its very confines, practically exhausting itself after nine weeks. Generally speaking, the most noticeable thing about it was that its virulence was more deadly in the colder up-country regions than in the moister and hotter coast areas. One condition which the progress of medical work during the war has demonstrated very clearly is the enormous liability of the African to helminthic affections. Fully three-quarters of the native population is infected, and the question of ankylostomiasis alone must have a marked bearing on the labour market. In fact, it is possible that the African lethargy inherent in this tropical region is largely dependent on this cause. In the principal towns trained anti-malarial gangs are employed clearing drains, filling in excavations, and oiling water. Rat-trapping and systematic investigation have been continued, though the coast and Nairobi were free from plague, and only one case was reported from Kisumu and eight at Nakuru. Voluntary prophylactic inoculations have been popular among Asiatic communities. A satisfactory vaccine has not yet been prepared that affords complete immunity from small-pox. The experience gained is that no strain, whether from overseas or locally prepared, has been successful over a prolonged period unless it has been reinforced. Generally a new strain has been substituted for the old. The total population is estimated at 2,627,080, composed of 5570 Europeans, 15,407 Indians, 202 Goans, 7468 Arabs, 236 other races, and 2,596,379 natives. Of the European male adult population (2493) 598 were classified as Government officials, 1195 as planters and farmers, 498 as commercial, 123 as missionaries, and 57 as professional men, the remaining 22 being unclassified.

EVACUATION OF WOUNDED IN LAPLAND SNOW.

IN his thesis for the degree of M.D.Vict., Dr. A. H. Macklin, who is now on his way as surgeon in the *Quest* to the Antarctic again, gives a good account, with excellent pictures, of the difficult country in Lapland about Murmansk, in which he was fighting in the North Russian *Syren* Expeditionary Force in 1918–19. The country was within the Arctic Circle, and very cold, though not always very cold as the Gulf Stream just touches the Murman coast. Major (as he then was) Macklin had to organise the evacuation of the wounded and sick from the mobile columns, and would seem to have done it well. The wounded man was carried out of action probably in a man-drawn sledge, but men could not carry him far, so the orderlies quickly changed him into another sledge drawn by reindeer or ponies, after they had dressed his wound and wrapped him in a special bag against the cold, and thus he went to the regimental aid-post. Here he was given food, had his wounds dressed and splints applied, had his feet dry rubbed and anti-frostbite socks put on. Then, his feet packed in dry hay if available, he was rolled up in his special bag again with a hot-water bag, and sent on. The "special bag" was a wadded quilt, 7 ft. by 7 ft., of wool and cotton in a close-woven cloth cover (*not* waterproof); this was secured round him, the foot-end turned up to prevent draughts, and a blanket tucked round his shoulders as well. He was then laid amongst hay in a sledge with a hood over him. At relay posts the animals might be changed, the patients got hot food, urinals, bed-pans, and were held for resuscitation if necessary, and in time they reached the advanced dressing station. The great problem was to avoid cold and frost-bite. Dr. Macklin, whose two years' experience as a dog-driver with Shackleton in the Antarctic, as well as his service in the war in the Italian Alps, give his opinion weight, recommends against frost-bite of feet: 1. No oil or grease. 2. Dry rubbing of feet, three pairs of socks, each successive pair a size larger than the last, and then loose boots; no constriction; two loose pairs of socks being better than three that are tight. Conditions were very different in North Russia from those in the other theatres of war. It sounds odd to find 20 reindeer in the war establishment of a medical unit ("10 to draw, 10 to break trail"). In that country, too, matches were very valuable; so while the "establishment" shows "Rations, 425 lb.," there also appears "Matches, 17 boxes."

Dr. A. H. Macklin is the son of Dr. T. T. Macklin, of Lancaster.

A GARDENING DIARY.

THE medical man who devotes his scanty leisure to gardening or to the superintendence of the care of a garden will find in the Garden Lover's Diary, 1922, published by the Cable Printing and Publishing Co., at 2*s.*, brief hints as to appropriate tasks for any season, interspersed with pleasant illustrations and a few verses.

K. V. C.—The address of the Medical Defence Union is 4, Trafalgar-square, London, W.C. 2.

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